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Farmers preferred end-values related to their use of forward contract

- A means-end chain analysis

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- A Means-end chain analysis

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Uppsala, June 2015

/*Ricard*

Summary

Today's farmers are constantly affected by the fluctuating world market prices on grain and thereby the price risk that comes with the price fluctuations. The volatile prices of grain increase the price risk within the business, which in turn affects the profitability of the business. The fluctuating prices together with the increased price risk within the farm business have opened up the market for hedging instruments.

In this master thesis project, the aim is to *identify the underlying end-values of 30 Swedish farmers' related to their choice of using hedging and the product; forward contract.* The study is based on the *means-end chain* (MEC) approach together with the *laddering interview technique*. This approach has been used in order to analyze 30 Swedish farmers cognitive structure in their choice of using the hedging product. Hence, the intention with the approach was to identify *attributes, consequences* and *values* related to the farmers' choice of using hedging as a strategy to mitigate the price risk. To accomplish a more extensive analysis of the farmers underlying end-values, the personal value theory was used as a complement to the MEC approach. The findings from this study can thus provide an understanding for the farmers' motives of using hedging.

After identifying the underlying end-values, they were categorized into various value groups related to the personal value theory and the ten universal value groups. Six underlying end-values was identified during the interviews with the farmers, *Feel good, Feel calm, Operate a viable and competitive business, Continue business, Control over business* and *Security.* By analyzing these values, the author could recognize five of them as strongly related to the personal value theory and the universal values groups. The end-values *Feel good and Feel calm* were both related to the personal value *Hedonism*, further were the end-value *Feel good* also related to the personal value *Self-direction*. The end-value *Control over business* was related to the personal value *Power.* The end-value *Continue business* was related to the personal values, *Security, Benevolence and Achievement* depending on the situation the farmers referred to in the interview. The fifth value that was strongly associated with the personal value theory was *Security* which was related to the personal value *Security.* The end-value, *Operate a viable and competitive business,* was first recognized as the value group *Achievement,* which is explained as the farmers' willingness to reach personal success. The value could be seen as a value in itself, or a value related to the business rather than the farmers' personal welfare. Therefore, the value has been argued to appear as a business value instead of a personal value for the farmers.

The findings of this study could help companies that are offering hedging instruments to create new instruments that are conducted in order to satisfy the farmers' needs. The obtained knowledge of the studied problem can also contribute as guidance for companies when thinking of advertising, starting new campaigns or implement new hedging tools. Further, the study could inspire or influence other farmers that are thinking of using forward contract as a strategy to mitigate the price risk.

Sammanfattning

Dagens lantbrukare är ständigt utsatta för fluktuerande priser på spannmål och därmed utsätts de för risk. Det volatila priset på spannmål ökar prisrisken för lantbrukaren, vilket i sin tur påverkar lönsamheten för företaget. Det fluktuerande priset tillsammans med den ökade prisrisken i lantbruket har öppnat upp marknaden för användandet av prissäkringsinstrument.

Syftet med studien är att *identifiera 30 svenska lantbrukares underliggande slutvärden relaterat till deras val av att använda prissäkring och produkten; terminskontrakt.* Studien är baserad på det teoretiska ramverket *means-end chain* (MEC), samt intervjumetoden *laddering*. Tillvägagångsättet används för att analysera 30 svenska lantbrukares kognitiva struktur i valet av att använda terminskontrakt. Metoden används i avsikt att identifiera vilka *attribut, konsekvenser* och *slutvärde* som är relaterade till lantbrukarens val att använda prissäkring som en del av strategin att minska prisrisken. För att genomföra en mer utförlig analys av lantbrukarens underliggande slutvärde har teorin om personliga värden (*personal value theory*) använts som ett komplement till MEC teorin. Resultatet från den här studien kan bidra till en ökad förståelse av lantbrukarens motiv för användandet av prissäkring.

De identifierade underliggande värden blev kategoriserade i olika värdegrupper relaterat till teorin om personliga värden och de tio universella värdegrupperna. Sex underliggande värden kunde identifieras utifrån intervjuerna med lantbrukarna, *Må bra, Känna ett lugn, Driva ett livskraftigt och konkurrenskraftigt företag, Fortsätta driva gården, Kontroll över verksamheten* och *Säkerhet*. Genom att analysera dessa värden kunde författaren utnämna fem som starkt relaterade till personligt värde teorin och de tio universella värdegrupperna. Slutvärdet *Må bra* och *Känna ett lugn* var båda relaterade till det personliga värdet *Hedonism*, ytterligare var slutvärdet *Må bra* också relaterat till det personliga värdet *Självriktning*. Slutvärdet *Kontroll över verksamheten* var relaterat till det personliga värdet *Makt.* Slutvärdet *Fortsätta driva gården* var relaterat till värdena *Säkerhet, Välvilja och Prestation* beroende på hur lantbrukaren svarade i intervjun. *Säkerhet* var starkt förknippat med det personliga värdet *Säkerhet.* Värdet att *Driva ett livskraftigt och konkurrenskraftigt företag,* var vid första bedömningen hänförbart till värdegruppen, *Prestation,* vilken förklaras som lantbrukarens vilja att nå personlig framgång. Värdet kan även ses som ett värde i sig själv, eller relaterat till företaget snarare än till lantbrukarens personliga välfärd. Därför diskuterades det om värdet kunde verka som ett företags värde istället för ett personligt värde för lantbrukaren.

Genom att identifiera lantbrukarnas underliggande slutvärde, kan studien bidra som ett hjälpmedel till företagen som erbjuder prissäkringsinstrument för att tillfredsställa lantbrukarnas behov och motiv. Den införskaffade kunskapen om problemet kan också bidra med en förståelse för företag som erbjuder produkten och bidra med kunskap om lantbrukarens motiv vid implementerandet av nya prissäkringsinstrument, reklamutskick eller vid nya kampanjer. Fortsättningsvis kan studien bidra med inspiration till lantbrukare som tänkt använda terminskontraktet som en del av sin prissäkringsstrategi.

Abbreviations

FAW – Farm animal welfare

HVM – Hierarchical value map

MEC – Means-end chain

SJV – Statens Jordbruksverk – (Swedish board of Agriculture)

USDA – United States Department of Agriculture

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1 Introduction

In this chapter the background is presented in order to introduce the reader to the subject and the researcher's perspective of the problem. Hence, the aim and delimitations of the study will be presented in this chapter.

1.1 Background

Farmers in the whole world are facing a fluctuating world market on commodities, which includes the price of grain (Da Silveira *et al.*, 2014). This outcome increases the risk for the individual farmer since he or she must adapt to the world market. Risk is something that occurs in every industrial sector including the agricultural sector. Previous studies have revealed that farmers are constantly exposed to different types of risks within their businesses (Hansson & Lagerkvist, 2012; Hardaker *et al.,* 2004; Miller *et al.,* 2004; Nilsson, 2001). Researchers have categorized the risks into different types in order to understand how the risks can be managed. Examples of categorization include *Tactical/Operational risks and Strategic risks* (Miller *et al.,* 2004; Boehlje *et al.,* 2005). Besides this categorization of risks, there are literatures that categorized risk into four different category groups.

Hardaker *et al.* (2004) provided a detailed description of four different categories of risk: *The institutional risk or the political risk* is related to the governmental and policy makers' impact on the farm business (Hardaker *et al.,* 2004). The political risk refers to changes in political decisions that lead to uncertain outcomes for the farmer. Examples of such risks include new trading policies and new legislations in agriculture. The second category of risk is *the human risk* and this type of risk is related to the people who are involved in and operates the farm business (*ibid*). The people who are involved in the business affect the profitability of the farm, which means that they constitute one type of risk sources in the business. An additional human related risk factor is when farm managers are exposed to life-crises like divorce or death which may have dramatic consequences for the farm business. The third category of risk is *the risk of production* which comprises risk factors that are beyond the control of the farmer and that cannot usually be affected or mitigated by the farmer (Hardaker *et al.,* 2004). Miller *et al.,* (2004) agreed and stressed that typical production risks are biological pest issues or bad weather conditions such as hail, snow or heavy rain. Selvaraju (2010) argued that the risk of weather condition may contribute to affect other risks such as the financial risk, because it affects the yield and thereby the farmers' financial position.

The fourth and the final category of risks suggested by Hardaker *et al.,* (2004) is *the price risk or the financial risk.* This risk type has direct effect on the profitability of the farm. A negative price risk can have large impact on the business (Da Silveira *et al.,* 2014; Selvaraju, 2010; Miller *et al.,* 2004). Some of the risks (e.g. production, price & institutional), arise as an effect of the accelerating changes in the agricultural sector, and makes the future more unpredictable compared to before (Boehlje *et al.,* 2005). Although there are a lot of risks

within the agricultural sector, the price risk is considered the major risk, and this type of risk is in focus of investigation in this study (Da Silveira *et al.*, 2014; Miller *et al.,* 2004).

An example of how the production and the price risk are related is the harvest year of 2014, which was a great year for the Swedish grain producer, with the largest total harvest in Sweden since 1997 (Lantmännen 1, 2015). The total amount harvested grain in Sweden was estimated to 5.7 million tons this year (SJV 1, 2014). This corresponds to, an increase of 14% compared to year 2013. Although Sweden has a small impact on the world market price of wheat, the harvest year of 2014 was also a great harvest year worldwide, something that resulted in a decrease of grain prices during the harvest period of 2014 (Figure 1).

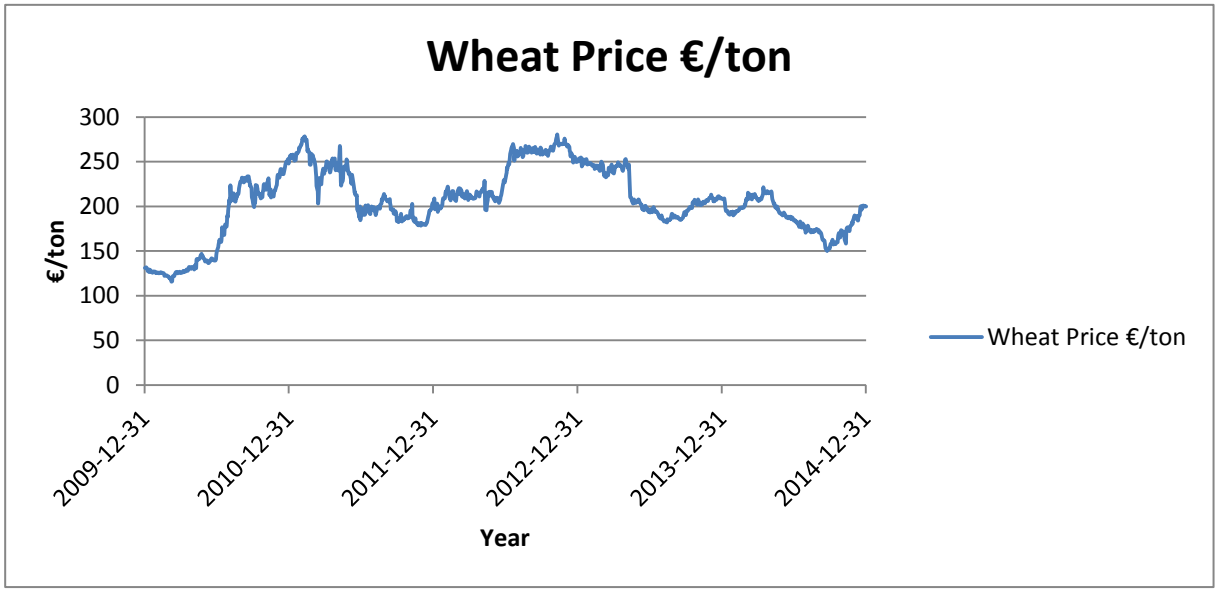

Figure 1, Price of wheat on MATIF in Euro/ton (Handelsbanken, 2015, Own arrangement)

Boehlje *et al.* (2005) stressed that farms in the world have become almost industrialized, with larger machineries and more arable land per farm. A contributing factor that has impact on the farmers' price risk is that farms all over the world are generally becoming larger and the Swedish farms are following the trend (SJV 3, 2014). The number of small-scale farms in Sweden has decreased at the same time as the number of large farms has increased during the last decade (SJV 3, 2014). This development leads to a situation where farmers will have to finance new machineries and land, which requires a more steady income (Miller *et al.,* 2004). This leaves the farmer with an increased risk associated with higher costs and debts. It is well known that farmers are dependent on their income of grain, but these higher costs makes the farmer even more vulnerable to the accelerating price changes on grain.

The ongoing deregulations of agricultural products together with increased price volatility on the commodity market in recent years, makes the information of price fluctuations and the development of the market more important for the farmer to consider (SJV 2, 2008). The fluctuating prices of wheat may depend on many different factors. Factors that are affecting

the fluctuating prices are e.g. the supply and demand of wheat products which is a result of the increased world population and different harvest yields over the world (Trostle, 2010; Hardaker *et al.,* 2004).

Because the world market price of grain is constantly fluctuating from day to day (Figure 1) the farmer could benefit from securing the price at a level where he or she is satisfied. Shepherd (1997) argues that efficient market information gathering shows to have positive beneficial effect on traders and farmers. The farmers can benefit of being up-to-date with information about prices to have a stronger bargaining position when trading with contracts. This is confirmed by Da Silveira *et al.* (2014) who stressed that farmers' who uses hedging tends to be well informed of output prices on commodities and selling prices of grain. The strategy and hedging tool the farmers choose depend on the level of risk they are exposed to or what level of risk they want to have (Miller *et al.,* 2004). It is especially important for the farmers to have a marketing strategy for their grain in a volatile market (*ibid*). A marketing strategy may be more or less aggressive, together with more or less elements of risk, depending on the farmers' preferences and what phase the company is in (Lantmännen, 2014).

The use of hedging as a strategy to mitigate the price risk on agricultural products has become common on the American market during the last decade (CBOT, 2013). The main reason is the increased global demand together with the availability of electronic trading instruments. Therefore, it is now important for the user to have knowledge and understanding of how to use risk reducing instruments to manage the risk (*ibid*). The increased number of large farms in Sweden during the last decades, along with the great harvest year of 2014 (SJV 1, 2015; Lantmännen 1, 2015) provides the farmer with a larger volume of grain to handle, which could expose the farmer to a new level of risk. All risks can obviously not be removed since there has to be a risk in order to obtain a gain (Miller *et al.*, 2004). Even though, all risks cannot be removed, some of the risk can be mitigated with risk management strategies such as hedging.

Hedging, by using forward or future contracts are examples of strategies for the farmer to protect them from price fluctuations on the market and thereby the price risk that can occur in the agriculture business (Da Silveira *et al.,* 2014; Miller *et al.,* 2004). It is hard to determine the farms' result in a world market with fluctuating prices on commodities. This uncertainty has opened up the market of hedging in the form of forward and future contracts. These are hedging instruments that are used to secure the price at a specific level. Forward- and future contracts can help the farmer to assess the price and thereby the turnover for the business (SJV 2, 2008), it can also help the farmer to create a budget for the next year.

Previous studies have investigated strategies to manage the price risk by using hedging instruments. A study made by Nilsson (2001) revealed that farmers are likely to decrease their price risk with 6-77 percent by using optimal marketing strategies when selling the grain. Even though, farmers would benefit from using strategies (Nilsson, 2001) their actual behavior on the market may differ from what would be optimal for the farmers to do

(Pennings, 2003). Although there are a lot of strategies and hedging instruments to choose between in order to mitigate the price risk, there is limited information about what aspects that affect the farmers' decision of using hedging.

Discussions of hedging occur on a regular basis in Swedish media. A Swedish agricultural magazine stressed the importance for the farmer to use hedging as a strategy for commodities, and compared the importance to sowing and harvesting (Atl 1, 2008). Hedging as a tool is appreciated by agricultural economic advisors in Sweden, and described as a way to reduce the risks and get a more even result over the years (Nilehnteknik, 2012). This is confirmed by Miller *et al.* (2004) and Da Silveira *et al.* (2014) who stressed that hedging is an efficient strategy to manage price fluctuations. At the same time as the farmers interest for hedging is increasing over the world (Atl 2, 2011; CBOT, 2013), several factors may affect the farmers strategies and choices concerning the use of a certain hedging instrument. These aspects are something that Lantmännen Lantbruk is working with to create the best possible instrument based on the farmers' needs.

This study was carried out together with Lantmännen in Malmö, which is an agricultural cooperative owned by Swedish farmers (Lantmännen 2, 2014). Lantmännen is one of the largest corporate groups within energy, food and agricultural products in the Nordic region. Lantmännen is also the supplier or distributor of the hedging instrument *forward contracts* that has been further investigated in this study. Forward contract was chosen for this study because it is the most used contract when it comes to selling the harvest, but also since it is considered to be an efficient instrument to mitigate the price risk of physical goods (SJV 2, 2008). This is also confirmed by Maria Andersson at Lantmännen who stresses that it is the most common contract offered by Lantmännen that is used by the farmers to protect themselves against price fluctuations (pers. comn., Andersson, 2015). Since Lantmännen is the largest supplier of this type of contracts it can be argued that it is the most commonly used instrument to mitigate the price risk of grain in Sweden. The contract means that the farmer commits an agreement to deliver a specified quantity to a specific price at a specific time (Lantmännen, 2014). Lantmännen is forced to take care of the grain at the agreed price, the farmer can transfer the price risk from their own business to Lantmännen. Hence, Lantmännen is making a new contract with the retailer and can thus manage the risk of price volatility. The forward contract is a good alternative for the farmer that is following the market, and is willing to sell the whole or a part of the harvest to a secured price before delivery (*ibid*).

1.2 Problem and aim

Farmers are facing an increasingly fluctuating market on grain, the price of grain is constantly fluctuating due to the demand for agricultural products and food, diverse weather conditions in large production areas and other factors related to politics and production (Hardaker *et al.,* 2004; Da Silveira *et al.,* 2014). Hedging gives the farmer an opportunity to get a steady income from the grain. The secured price provides the farmer with a better planning horizon, where the farmers know the future income. Another affecting factor is the increased costs within the agricultural business.

Increased costs in the agricultural business, as a result of the industrialization and new technology make the farmer more vulnerable to the fluctuating prices of grain (Miller *et al.,* 2004). The farmers are therefore more dependent on their income of grain, which makes knowledge and information of grain hedging instruments and strategies to manage the price risk essential for the farmer to consider (Miller *et al.,* 2004; Lantmännen, 2014). The farmers' ability to follow their strategy and manage the price risk is crucial for how the farmer will succeed (Da Silveira, *et al.,* 2014). It is widely known by experts and academics that hedging is a convenient instrument to reduce or mitigate the price risk (*ibid*). Although previous studies has been conducted on the subject of hedging, there is lack of studies investigating what motives that guide the farmers choice of using hedging as an instrument to mitigate the price risk. In order to have instruments that fit the farmers' perceptions, it is important for the companies that provide these instruments (e.g. Lantmännen) to have knowledge and understanding for the farmers' perceptions and motives in their choice of using hedging instruments.

Another problem related to the companies that take care of the farmers' grain and provide the hedging instruments, they are exposed to risks themselves depending on the farmers' willingness to use hedging. The companies that provide the hedging instruments can therefore plan their own strategy on the grain that the farms deliver. Their risk can therefore also be mitigated by having knowledge of the farmers' cognitive structure in their choice of using a certain hedging instrument (Lantmännen, 2014). This knowledge can help the companies that provide the instruments, to evaluate and improve the existing price risk reducing instruments in the future, to fit the farmers using motives. However, there is lack of knowledge and research of why farmers choose a specific instrument and what values the farmer consider being important in their choice of using a specific hedging instrument.

The aim of this master thesis project is to *identify the underlying end-values of 30 Swedish farmers' related to their choice of using hedging and the product; forward contract.* The values from the research will be based on the actual content of the farmers' cognitive structure. The means-end chain (MEC) approach together with laddering interviews (Peter & Olson, 2010; Reynolds & Gutman, 1988) has been used in this thesis, as the purpose of the study is to investigate the farmers' cognitive structure in a decision of using a product (Grunert & Grunert, 1995). The means-end chain theory together with the laddering technique is commonly used when investigating consumption behavior and consumers' decision making (e.g., Bitzios *et al.,* 2011). Hence, the method is common when evaluating consumers' decision making, it has never been made in order to evaluate farmers' decision making related to the use of forward contracts.

The MEC approach can be used to get an understanding of the consumers' choice criteria that will lead to their fulfillment of values. This is made by an analysis of their cognitive structure process (Gutman, 1982; Reynolds & Gutman, 1988; Peter & Olson, 2010). In this thesis the approach has been used in order to reveal what underlying values the grain farmers consider in their decision making of using hedging. The personal value theory (Schwartz, 1992) is used

as a complement to the MEC approach to analyze the farmers' values of using forward contracts. The personal value theory (Schwartz, 1992) is working as an instrument to analyze the farmers' cognitive structure and guide their behavior to the actual value they are considering in the use of hedging. This is confirmed by Roccas *et al*. (2002) who stressed that values can be seen as something important for a person or a goal the person wants to achieve by doing a certain action. Values are further explained by Schwartz (1992) as individual, and a value for one person might be unexciting for another. Five features that can be related to all values are: (1) values are beliefs or concepts inseparably tied to emotions, (2) values exceed specific situations and actions, such as abstract goals, (3) values can be seen as motivation construction, which refer to the goals that people strive to achieve, (4) values guide the evaluation or selection of policies, events, people or actions, (5) values are arranged by the importance comparative to one another (Schwartz, 2006). The action, values and goals are in this study related to the use of hedging and the study will therefore try to explain what values that are linked to the farmers' cognitive structure and behavior of using the product, which in this case are forward contracts.

By identifying the farmers' perception of hedging with the means-end chain (MEC) approach together with the personal value theory, the farmers' motives for using forward contracts can be understood and analyzed. The MEC approach has recently been used when identifying consumers' values behind consumption decisions, (e.g.; Pieters *et al.,* 1995; Bitzios *et al.,* 2011). Recently, Hansson & Lagerkvist (2015) adopted the MEC approach to investigate farmers underlying values related to farm animal welfare (FAW), which proves that the approach can be used in other scenarios then to investigate consumption behavior. The chosen method and theories will therefore be the basis to reach the aim of this study.

Musser *et al.,* (1996) stressed that using a long term marketing strategy to mitigate the price risk over many years may not always be the best strategy for reducing the price risk for one specific year. Rather asking the farmers directly of their impression of a specific marketing strategy may provide more evidence than analyzing the strategy itself. Instead of asking the farmers about their specific strategy to mitigate the price risk, the study will investigate why farmers are using the forward contract and their perception and motives of the use. The study will be directed both toward farmers and companies working with hedging. The study can thereby contribute with an understanding of the farmers' motives of using hedging, along with an understanding for the underlying values that are motivating the farmers to use hedging instruments.

1.3 Delimitations

The study will focus on investigating 30 Swedish grain producers, with a total area of arable land larger than 50 hectares. Smaller farms have been excluded in this study since they are working with a smaller volume of grain which makes them less vulnerable to the price risk than a larger producer. Another reason is that the study is focusing on full time working farmers. A smaller farm might therefore be more dependent on an income besides farming. The farmers that are reliable of the income from the farm may therefore be exposed to a

higher risk, which could mean that they are in need of a hedging instrument to a higher extent than a smaller farmer. The chosen farmers were picked from different production areas in Sweden. This increases the validity and gives broader picture of the reality to the study, compared to interviewing farmers from the same production area. In order to reach out to farmers in different production areas, the interviews were made in the form of telephone interviews. This method could affect the respondents' answers, if they wanted to express their answer in a way that only could be done by using a face-to-face interview. The MEC approach together with laddering interviews has been proven to be a suitable framework for investigating peoples underlying values in their choice of a certain product. As a complement to the approach, the personal value theory has been used, in order to get a deeper description of the farmers preferred end-values. Another theory like the decision-making process theory could be used, but since that theory is investigating the farmers' decision process and not the actual decision, this outline is preferred for investigating the chosen problem and aim.

The study has been limited to investigate Swedish farmers that are members of Lantmännen, since the hedging instrument is provided by Lantmännen. The study has been limited to look at one specific hedging instrument (i.e. forward contracts) since it is a useful instrument to mitigate the price risk within the farm business. The interviewed farmers were selected from the largest agricultural regions of Sweden (Figure 7).

The literature has been collected mainly through the database at SLU Library such as Epsilon, Libris and Primo. Other databases such as Google Scholar and Scopus have been used to get a wider searching area. These delimitations could affect the study in a way that the author could not get information to relevant articles that were not available from these searching instruments. The keywords that were used in the search process were; farm risk management, risk in agriculture, means-end chain theory, laddering interviews and personal values.

1.5 Outline of the thesis

The outline of the thesis is presented in this section, and explained in Figure 3. The outline starts after this chapter with a description of the theoretical framework and continues with method, results and ends with a discussion and conclusion.

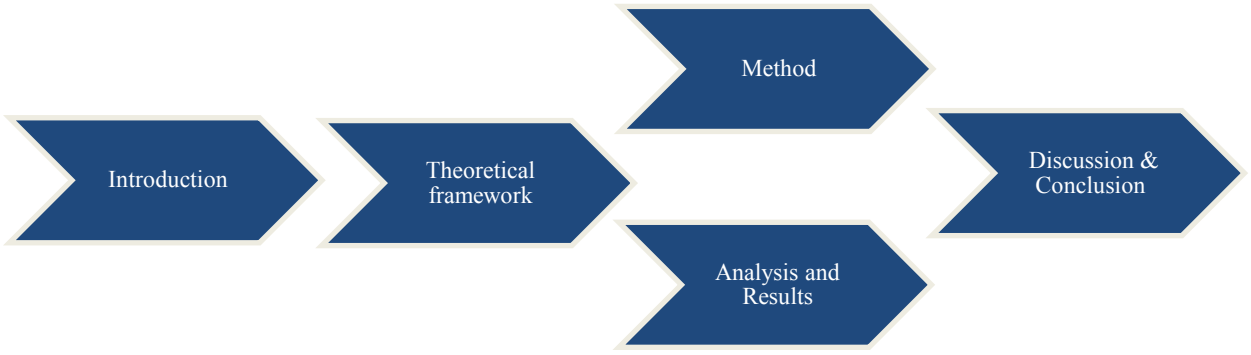

Figure 2, Own arrangement of the outline of the thesis.

- Chapter 2 – Theoretical framework

In chapter 2, there will be a presentation of recent published articles within the study area. Risk, risk management and the impact of risk and decision making in agriculture are presented in this chapter together with the chosen theories (i.e. the MEC theory together with the personal value theory) from which the empirical material will be analyzed.

- Chapter 3 – Method

In chapter 3, there will be a presentation of the method that is used to reach the aim of the study. A motivation of the chosen method will be described along with the courses of actions that were made and the interviewees.

- Chapter 4 – Results and Analysis

The results and analysis from the interviews are presented in chapter 4. The results will be analyzed through the HVM in this chapter. This chapter will also lay as a basis for the discussion and conclusion.

- Chapter 5 – Discussion & Conclusion

Chapter 5 will present the discussion and conclusion of the empirical results from the interviews together with recent studies and the chosen theory. Thus, in order to reach the aim of the study.

2 Theoretical framework

The theoretical framework focuses on providing a wider understanding of the subject area. The chapter starts with the reviewed literature which will be the background basis for the following theory. The studied literature aims at creating an understanding for the price risk within the farm business, why we need hedging in order to manage the risks and what type of farmers that tend to use hedging. By taking the theory of risk within the agricultural sector into consideration, the reader can get a better understanding for the need of hedging instrument. The two underlying theories are further explained and presented. The first chosen theory is the means-end chain theory. The MEC theory usually refers to the consumers' behavior, but in this study the MEC theory will provide an understanding for the farmers' motives of using forward contracts. The personal value theory is used as a compliment to the MEC theory. The personal value theory is used to analyze the farmers' values of using hedging. The personal value theory can provide a better understanding for the farmers preferred end-values, and both theories will be the basis for the analysis and discussion of the empirics.

2.1 Risk

Hardaker *et al.* (2004) stressed that risk and uncertainty are considered to be very similar in many situations but usually can be separated by definition. Uncertainty can be defined as imperfect knowledge in a situation while risk can be defined as uncertain consequences, usually related to negative consequences (Hardaker *et al.,* 2004). Usually when people talk about risk, they think about potential losses as an outcome of a given situation (Miller *et al*., 2004). This outcome may vary, but usually it is associated with potential financial losses (*ibid*). The main focus will lay on the price risk in this study since risk usually is related to potential financial losses, although, the investigated hedging instrument (i.e. forward contract) works to reduce the price risk. Uncertainty has therefore been excluded in the investigation further in this study. However, due to the literature, there seems to be a negative emphasis associated with the word "risk".

2.2 Risk management in agriculture

The word risk is usually associated with a negative outcome, Hardaker *et al.* (2004) argues that risk is nearly inescapable and something that the farmer should not be afraid of. Farmers have over time tried many strategies to make the business less risky, and have adjusted it to fit their production. It is common, in business, that profit or gain is something that is rewarded for the one who can tolerate the risk. The task for the farmer is not to avoid, but rather, manage the risk efficiently, this in order to resist adverse outcomes in the business (*ibid*).

All people have different attitudes and perceptions of risk (Hardaker *et al*., 2004). Individuals can be divided into three different categories depending on their attitude toward risk. These categories are risk-averse, risk-neutral and risk-lover (Perman *et al.,* 2003; Hardaker *et al.,*

2004). Most people including farmers tend to be more risk-averse which means that they are willing to give up some effort or expected return in order to reduce the risk. Hansson and Lagerkvist (2012) agrees with Hardaker *et al.* (2004) that most farmers are likely to be risk-averse, the farmers will therefore according to the theory use strategies like hedging or insurance to protect themselves against the price risk (*ibid*). A risk-loving person will always choose the alternative that gives the preferred outcome no matter the level of risk that comes with the alternative (Perman, *et al.,* 2003). The risk-neutral person has an attitude that is somewhere in between the risk-averse and the risk-lover.

Two reasons why risk is considered significant in the agricultural sector are that *most people dislike risk* and the *downside risk* (Hardaker *et al.,* 2004). Hardaker *et al.* (2004) describe farmers as risk averse and bases the assumption on analyzes of farmers actions to manage risk. An example is that farmers are using marketing strategies that are in line with their preferences, this could be to have a diversified production to spread the risk or buy insurances to protect them. The farmers will rather stay away from a risky alternative that pays off in a long run if it means that they will be exposed to an intolerable chance of loss (*ibid*). Downside risk is in the financial sector described as a decision or a situation that deviates from the norm or the best option and can lead to a lower outcome (Hardaker *et al.,* 2004). Crop yield is an example of the downside risk, since it will be affected by numerous of uncertainty factors such as weather conditions, pests or crop diseases in different phases of the growing process. Thus, farmers can benefit from practice with different models of analytical assessments tools of riskiness in the agricultural sector.

The level of risk and uncertainty at the farm, originates from different areas in the production of grain, marketing, legislation, environmental- and financial conditions and family health aspects (Hansson & Lagerkvist, 2012; Meuwissen *et al.,* 2001; Miller *et al.,* 2004). Some risks would not exist without the farm and are therefore directly related to the farm business. Henceforth, other risks are based on the individuals' participation in the farm business and can therefore be indirectly related (Miller *et al.,* 2004). Boehlje *et al.* (2005) and Miller *et al.* (2004) are dividing risks into two different groups which are *Tactical/Operational- and Strategic risks.* Tactical/operational risks is usually seen as traditional risks faced in the agriculture sector such as business risk and financial risks, these risks can be price volatility, input costs or debt to finance an investment. Thus, the strategic risks focus on areas like political, macro-economic and product markets. Tactical/operational risks are easier for the farmer to manage, since information about these risks is generally accessible. Although, when Boehlje *et al.* (2005) and Miller *et al.* (2004) are dividing the risks into two groups, Hardaker *et al.* (2004) provides another more detailed categorization with four different areas which are production, financial, institutional and human risks. Many of the risks within the agriculture sector depend on each other e.g. the price risk is closely related to the production. The price risk has been in focus of this study since it affects the whole business and is a big issue for many farmers.

The financial risk or the price risk is closely related to the production risk, and is one of the main risks in farming (Miller *et al.,* 2004; Selvaraju, 2010; Da Silveira *et al.,* 2014). A lower

level of produced grain in the world, would generally result in a higher price of grain, the consequences would be a natural hedge for the farmer (Miller *et al.,* 2004). This may however not be relevant for an individual farmer since the market price is affected by many other factors. The changes in commodity prices are essential in the farming business (*ibid*).

Since farms generally are becoming larger, together with the change in technology, more farmers choose to purchase their own machinery and land (Miller *et al.,* 2004). This implies that the farmer needs to have a higher income to pay for the input costs which can make the farmer more vulnerable to the volatile prices (*ibid*). Therefore, a higher secured volume of grain can protect the farmers against price fluctuations and give a secured income to pay for the outputs (*ibid*). The strategy for mitigating the price risk is a form of risk management at the farm level.

"Risk management is the systematic application of management policies, procedures and practices to the tasks of identifying analyzing, assessing, treating and monitoring risk." (Hardaker *et al.,* 2004 pp. 14)

Risk management should be included in all managements, from a small scale family farm to a large corporation (Hardaker *et al.,* 2004). Farm risk management is a plan for the farmer to maximize income opportunities and minimize losses. There is no certain pattern or a series of fixed steps to follow in order to manage the risk within the farm business. Risks evolve in the same extent as the world is changing, it is therefore impossible to follow a certain pattern. Working with risk management is rather a continuous process that must take all relevant factors into consideration in order to make decisions for the organization. Risk management in the agricultural sector is a challenging topic for most farmers (Hardaker *et al.,* 2004). Nearly all decisions the farmer makes will affect the business in some way, even if it is an everyday decision or a once in a lifetime decision, therefore, it is always a risk with the decision-making.

Since the risks in agriculture are highly unpredictable and changing all the time, it requires a lot from the farm manager. To manage these new unpredictable risks, the manager is in need of new assessment tools, but it also requires a good work with the systematic decision context (Boehlje *et al.,* 2005).

2.3 Characteristics of farmers that are using hedging

This section will provide the reader with a deeper understanding of the farmers' decision of using hedging together with factors that affect the decision. Different aspects of the farmers perception of hedging has been reveled in recently published and elderly literature (Da Silveira *et al.*, 2014; Musser *et al.,* 1996; Shapiro & Brorsen, 1988). The previous literature show what characteristics that are typical for the farmer who choose to use hedging and why. Musser *et al*. (1996) points out aspects like farm size, geographical location and diversification (e.g. animal production or income) as factors that may affect the hedging decision. Da Silveira *et al.* (2014) agrees that size of production affects the farmers decision

of using hedging, they also point out education and behavioral variables as important factors to consider. This is confirmed by Shapiro & Brorsen (1988) who stressed that age, experience, education and financial position are factors that affect the farmers' decision of hedging.

Factors that are significant for the farmers' decision in hedging are factors such as, years of experience managing a farm and formal years of education (Shapiro & Brorsen, 1988; Silveira *et al.,* 2014). Another factor is the age of the farmer, that seems to be negative related with the hedging decision, since it requires a longer planning horizon, to allocate the costs that are related to new management strategies (Musser *et al.,* 1996). A younger farmer may also be more open to try and learn new marketing strategies. Shapiro & Brorsen (1988) stress that education and work experience as a farm manager tends to have a positive impact on farmers decision to use hedging. The argument is confirmed by Da Silveira *et al.* (2014), who stress that significant aspects for farmers that use hedging are, higher level of education, risk-averse, larger production and that farmers' tend to be informed of world market prices of commodities more often.

Farmers with a large production are likely to use hedging such as forward pricing methods to a greater extent than the average farmer (Musser *et al.,* 1996). An explanation of this may be the permission of economy of scale in a larger farm, which can provide the farm with a better bargaining situation together with a more cost efficient business. A larger farm may also have a greater storage capacity that can affect the hedging decision of physical grain. Another reason could be that the larger farm is more exposed to risk due to the higher costs of a larger business, which will make the farmer more dependent of the income of grain. Together with the farm size, the geographical location can be significant for the farmer (*ibid*). Farmers that are affected by adverse weather conditions hedge to a lesser degree than other farmers (*ibid*). This may imply that the farmers are taking the production risk in to consideration while hedging.

Another strategy to mitigate or manage the risk in agriculture is by having an income from another production area, such as having a diversified production (e.g. livestock production). These strategies may be more used than hedging (Shapiro & Brorsen, 1988). Musser *et al.,* 1996 stress that farmers that use diversified production such as livestock production use hedging in a lesser extent than others to manage the financial risk.

A more leveraged farm is more likely to use hedging instruments (Shapiro & Brorsen, 1988), this as a result of reducing risk in the business. A farmer with a lower debt ratio may not be in need of reducing the risk in the same extent as a farmer with a higher debt ratio. Therefore, the financial aspect is of great importance for the farmers' decision. The debt-to-asset ratio and income stability are factors to consider for the farmer when making decision of hedging. Hedging may also help the farmer to get a secured level of profit which will make it easier for the farmer to make future budgets.

Isengildina and Hudson (2001) investigated factors that affect cotton farmers hedging decision. The factors that were affecting the choice of using hedging in this study were closely related to the factors that were detected by Shapiro & Brorsen, (1988), Musser *et al.* (1996) and Da Silveira *et al.* (2014). The most important factors that can explain cotton farmers use of forward pricing instruments was the farm size, the producers own preferences, risk aversion, use of crop insurance, off farm income and income from government payments. According to the literature, different aspects may affect if the farmer use hedging or not. Table 1 gives an overview of what the literature takes into consideration when evaluating what aspects that characterizes the farmers who use hedging. The left column explains the characteristics while the right shows the reference from which the argument comes from.

Table 1, Who is using hedging according to the literature? (Own arrangement)

Characteristics	**Reference**
Farmers with working experience and education tend to hedge to a greater extent	Shapiro & Brorsen, 1988; Da Silveira *et al.,* 2014
Farmers that are risk averse uses hedging	Da Silveira *et al.,* 2014; Isengildina & Hudson 2001
Farmers with a larger production tend to hedge to a greater extent	Musser *et al.,* 1996; Da Silveira *et al.,* 2014
Farmers that are updated with information are using hedging to a greater extent (e.g. world market prices of commodities)	Da Silveira, *et al.,* 2014
Farmers with a higher leverage tend to hedge to a greater extent	Shapiro & Brorsen, 1988
Younger farmers use hedging in a greater extent	Musser *et al.,* 1996
Farmers that are affected of adverse weather conditions are not using hedging in the same extent as other farmers	Musser *et al.,* 1996
Farmers that has a diversified production tend not to use hedging (e.g. livestock production)	Musser *et al.,* 1996

2.4 Means-end chain theory (MEC)

The first chosen theory in this master thesis project is the means-end chain (MEC) theory. The original form of the MEC theory explains that product choices are based on the consumers' perceived attributes of a product, consequences that are related to these attributes and how these consequences can lead to satisfactory values or end-states (Gutman, 1982; Reynolds & Gutman, 1988). The MEC theory is generally used to obtain comprehensive knowledge about the consumers associations between different attributes, consequences and end-values of a certain product (Reynolds & Gutman, 1988). The MEC approach will help to analyze why farmers use forward contracts, and what satisfactory values the farmers obtain of using the hedging instrument. Peter and Olson (2010) confirm that the means-end chain creates a link

between consumers' knowledge about the attributes of a certain product with the knowledge of consequences and values related to the product. It is important that the consumers think internally of the product attributes in terms of their own perception and consequences of buying the product (*ibid*). The farmers will instead in this study think of the attributes, consequences and values related to their choice of using forward contracts.

The main purpose of using the MEC approach is to connect the farmers' product attributes and consequences stated as the "*means*", with the farmers personal values stated as the "*ends*" (Peter & Olson, 2010). The MEC approach assumes that the respondents are reflecting about product attributes according to their own experiences and personal consequences of a specific choice, this will then lead to "*The means to some end*" (*ibid*). The farmers will therefore have to think of their experiences of using forward contracts before the interview is conducted. Usually the end is referred to as a value or a consequence for the consumer (Gutman, 1982).

The MEC approach, offers a framework for understanding and identifying factors that describe the consumers choice criteria and behavior in the decision process (Olson & Reynolds, 2001). The consumers' choice criteria are analyzed by linking the consequences in the means-end chain. Hence, MEC will work as an approach to address the farmers' choice criteria when they are evaluating and choosing among different alternatives (*ibid*). Why these typical choice criteria are relevant and important for the farmer is also analyzed by the MEC approach. The MEC approach provides the researcher with an understanding of the consumers' decision making and the motives of using a certain product (Olson & Reynolds, 2001). However, the MEC approach will provide an understanding for the farmers' behavior when choosing a certain hedging instrument.

The four common levels of MEC are illustrated in Figure 3. Attributes are explained as physical characteristics of a product such as, quality (Peter & Olson, 2010). The attributes are divided in two groups which are concrete attributes and abstract attributes. Examples of attributes that can arise during the interviews with the farmers are e.g. avoiding selling grain at harvest or have a steady income. Functional consequences and psychosocial consequences are explained as consequences or benefits the product provides the consumer with. These consequences state the personal and internal consequences for a person, e.g. how the product make the consumer perceive well-being or how the consumer feel about using this product. For instance, a functional consequence would be something that is tied to using the product, or in this case using forward contracts. Instead, psychosocial consequences are benefits from using the product or instrument. Values are the preferred outcomes of the product and the end state (Peter & Olson, 2010), examples of values that may arise during the interviews are that the farmers want to enjoy life or continue the farm business.

The values can be stated in two groups; instrumental and terminal (Rokeach, 1973). The instrumental values can be related to behavior patterns, (i.e., courageous, honest, broad-mined). Terminal values are related to preferable end states of existence (i.e., security, happiness, accomplishment) (*ibid*). Consumption exists in order to satisfy the consumers' values. Therefore, consumption products are chosen for the end-values the product gets

through the certain attribute of the product. In this study, the product "forward contract" is chosen by the farmers in order to fulfill a certain need or a value which in this study is referred to as the end-values.

Figure 3, The four common levels of the means-end chain (Own illustration based on Peter & Olson, 2010 pp.77).

Olson & Reynolds (2001) stress that consumers make their own decision of what products or services to buy, built upon the expected consequences (e.g. experienced outcomes, goals, satisfaction or value achievement) that come with a specific alternative, this is also undertaken by the MEC approach in this study. Bitzios *et al.* (2011) agree and stress that the MEC analysis assumes that the respondents in the interview understand and are aware of their own personal motivations. Thus, the MEC approach can find a link between the attributes of a product and how the consumers value it (Bitzios *et al.,* (2011). The MEC approach is used to analyze the farmers' behavior and perception of forward contracts to understand the links between the farmers attributes connected with the underlying values that motivate the choice of using the instrument.

An example of the MEC chain from attribute to value is that the farmer use forward contracts to avoid selling the grain at harvest. The consequences related to this could be to ensure income in the business which would result in an end-value that the farmer can continue to operate the farm. Usually, the expected consequences are based on the consumers' experience of owning a certain brand or a product (Olson & Reynolds, 2001). The most important criteria in order to make a decision due to the MEC approach is the consequences and the anticipated experiences that are associated with the certain alternative (*ibid*). The MEC approach identifies that consumers' expectations of a new product can be both positive and negative due to their personal experiences, which are most relevant for them in their choice (*ibid*). The study will therefore depend on the farmers' perception of the forward contracts, and the outcome of the interviews may imply that the farmer have a negative view of the instrument.

In Figure 4 the different levels are illustrated with examples related to forward pricing. It can be difficult to distinguish or characterize the different levels since the difference between them could be considered as a bit "fuzzy" (Peter & Olson, 2010). For example, it might be hard to evaluate if an answer such as: "being with friends" is considered a psychosocial consequence or a value (*ibid*). Then the researcher must evaluate if the answer is leading further to another value, it might be considered as a psychosocial consequence but if the interview stops, it could be considered as the respondents preferred end-value.

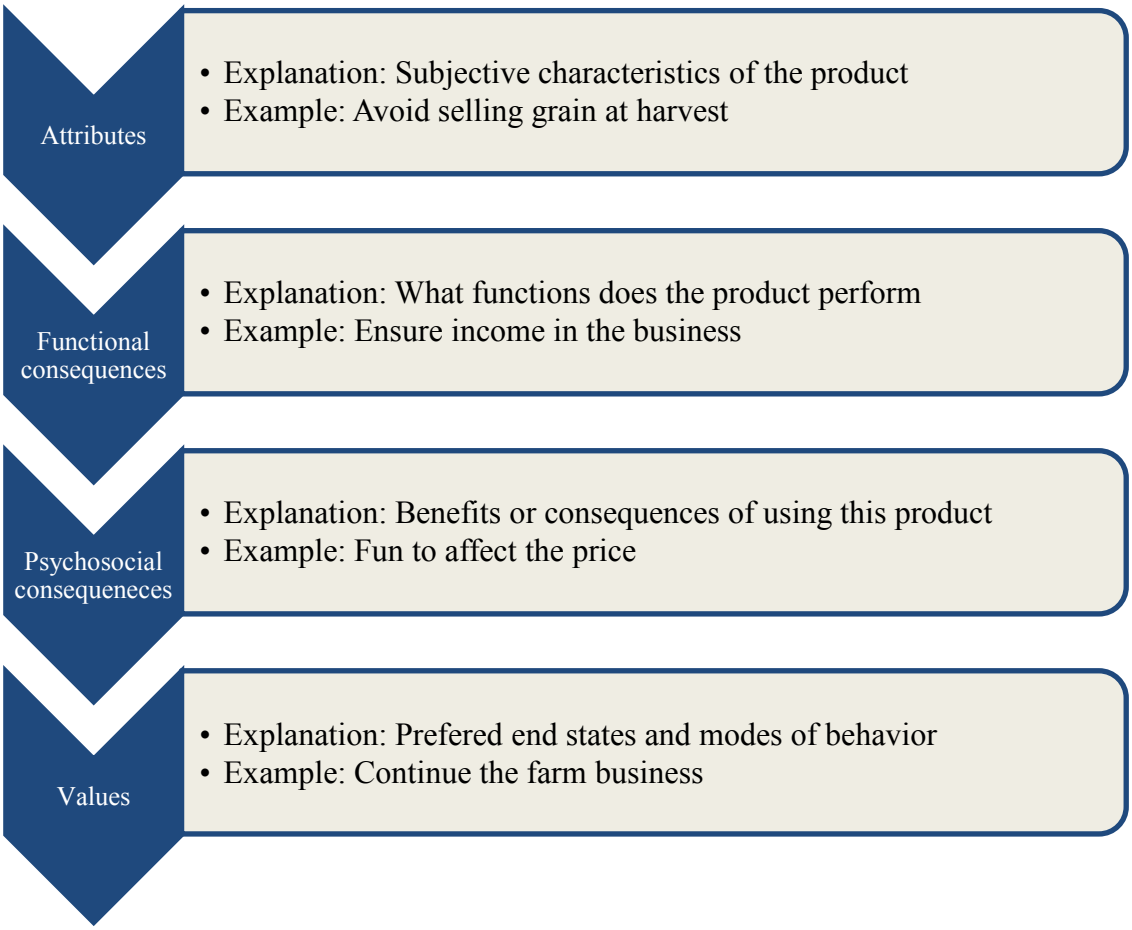

Figure 4, Means-end chain theory developed with examples on each level (Own illustration based on Peter & Olson, 2010, pp. 78).

The farmers were first asked what the forward contract means to them and why they are using it in their business, this was made to get to the farmers perception of the attributes of the product or in this case to the forward contract. In this case the farmer answered "to avoid selling grain at harvest". And then the interview continues with the researcher asking "why is that important to you" this to get to the consequences of the attributes, this continues until the farmer are unable to answer the question anymore and then the interview has reached an end-value which in this case was for the farmer to continue their farm business. The interview dialog that is explained above is called laddering interviews, which is an interview technique that is common to accomplish together with the MEC theory (Reynolds & Gutman, 1988). Grunert & Grunert (1995) explain how the product attributes, consequences and end-values are illustrated as a chain and afterwards disposed into a hierarchical value map (HVM), which can explain if a consumers' decision making process are either of a motivational or cognitive structure. The MEC and HVM approach are divided into two different views: the motivational and the cognitive view. The motivational view provides the researcher with an understanding of the consumers' buying motives. The cognitive view provides an understanding of the

consumers' knowledge of a certain product and how the knowledge is stored and organized in the consumers mind.

Peter & Olson (2010) argues that the main point of the means-end chain is to make the respondents think of their own consequences at different levels. The means-end chain is based on the consumers personally background experiences of a product, the value chain for each consumer will be unique. It can be hard to analyze if the answer is a functional or psychosocial consequences due to the farmers' perception of using forward contracts. But there are usually similarities among the respondents' preferred end-values (Peter & Olson, 2010).

2.5 Personal value theory

The second theory that has been chosen for this thesis is the personal value theory (Schwartz, 1992; Schwartz, 2006). The personal value theory is used in order to get a wider view and understand the values the farmers consider important when making the decision of using forward contracts. The personal value theory is working as a complement to the MEC approach in this study and can help to analyze the farmers preferred end-values. There is a gap in the literature of previous studies where the personal value theory are used to analyze the end-values from the means-end chain theory, and it is the first time these theories are combined in order to analyze the farmers perception of a hedging instrument. Schwartz (1992) has developed a value theory that has been implemented to this study, to see what values farmers consider when making a decision to use forward contracts.

Values are described by Roccas *et al.,* (2002) as something that people consider important and the goal they want to achieve. But values differ from the typical specific goal, since they are considered trans-situational. Values are further explained by Schwartz (1992) as necessary and they serve to guide principles in individuals' lives. When people think of values, they usually think of what is important for them in their lives (e.g. independence, success, pleasure, kindness, wisdom and security) (*ibid*). All people have values and a value that is important for one person may be irrelevant for another (*ibid*). Schwartz (2006) presented five features that are common to all values:

- Values are beliefs or concepts inseparably tied to emotions.
- Values exceed specific situations and actions, such as abstract goals.
- Values can be seen as a motivational construction, which refer to the goals that people strive to achieve
- Values guide the evaluation or selection of policies, events, people or actions.
- Values are arranged by the importance comparative to one another (*ibid*).

The values, goals and beliefs of individuals have been analyzed by researchers, this has contributed to information and knowledge about people's behavior when it comes to engage or disengage in different activities (Eccles & Wigfield, 2002). Henceforth, the knowledge of

individuals' values, goals and beliefs can be related to their performance behavior (*ibid*). So, the study can create an understanding for the farmers' choice in their cognitive structure when choosing to engage in an agreement of using forward contracts by analyzing the farmers' values and motives of using the product.

The sort of motivational goals that the different values express are crucial aspects that make the values different (Schwartz, 1992). People present their values cognitively in order to communicate with other individuals, when chasing their goals. Schwartz (1992) points out ten motivationally distinct, basic and broad values that are intended to embrace all essential values that are recognized in different cultures all over the world. The ten universal values that all people's behavior can be placed in are Power, Achievement, Hedonism, Stimulation, Self-direction, Universalism, Benevolence, Tradition, Conformity and Security (Schwartz, 1992; Bardi & Schwartz, 2003; Schwartz, 2005). These ten universal values are combined with the MEC theory in this study in order to analyze the farmers' end-values that arise from the interviews. These values derive from three universal requirements based on the human condition: The needs of every individual, welfare and survival as needs for a group of people, and prerequisites for social interaction between people (*ibid*).

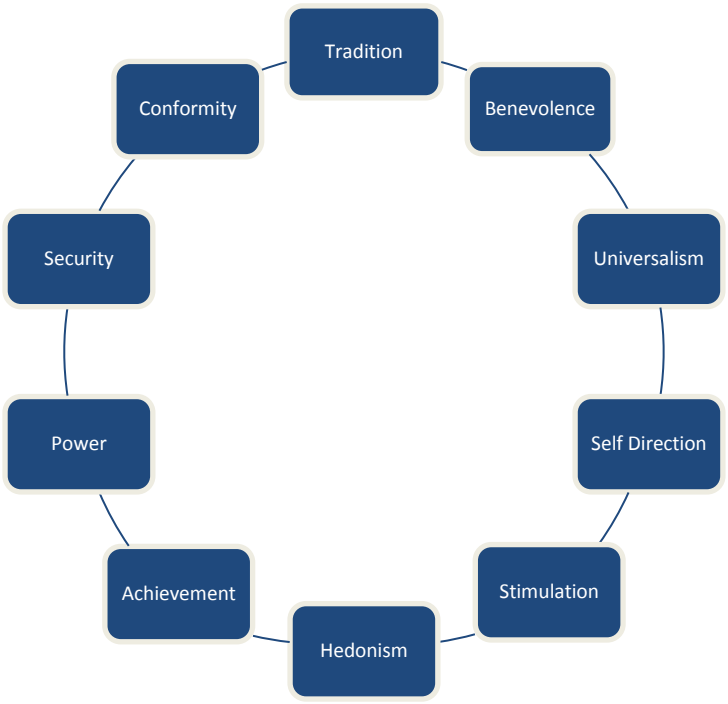

Figure 5, The 10 different value groups (Own illustration based on Roccas et al., 2002, pp.791).

The ten values (Figure 6) cover the categories of content that can be observed in earlier studies of value theories, in philosophical and religious deliberations of values and questionnaires based on values from different cultures (Schwartz, 1992; Bardi & Schwartz,

2003; Schwartz, 2005). Based on the ten universal values, it is possible to classify nearly all items that are found related to people's values (*ibid*). The farmers' values are henceforth categorized or classified into a specific value group. Examples of the different values with influences of how the farmers' values would look like in the classification are presented below. The values presented in this theory can be related to the farmers' values and motives of using forward contracts to mitigate the price risk.

Self-Direction – The defining goal for this value classification is that the farmer has independent thoughts and actions, such as, freedom, creativity, choosing own goals, curiosity and exploring.

Stimulation – The farmer has a presumed need for stimulation and variety for the purpose of maintain an ideal level of motivation, this can be related to excitement, a varied and challenge in life and novelty.

Hedonism – This value type is based upon the needs or the pleasure related to satisfy the certain value, as a satisfaction for the farmer to achieve a certain goal or enjoying life.

Achievement – This value is based on that the farmer want to achieve personal success by demonstrating competence related to social norms (e.g. that the farmer would like to be viewed as intelligent, ambitious, influential or successful).

Power – Power values can be seen as the farmer wants to have control over resources or people or as a social status or prestige (e.g. to have social power, be wealthy or preserving the public image).

Security – The goals of security value is safety, stability and harmony of a relationship or for them self (e.g. the farmer wants goals as family security, health, social order or continue the business).

Conformity – The motivational goal for conformity values are limitation of actions, feelings and impulses likely to harm or upset others such as interrupt social norms or expectations. Another example can be that the farmer wants to adapt themselves to their environment and do as everybody else.

Tradition – This value type can be related to a special group's fate or common experiences. The value or the goals could be of respect for tradition or different cultures or just do what we always have done.

Benevolence – The goal for this value type is to enhancing and preserving the welfare for people within the group, to preserve the social contact (e.g. that the farmer is helpful, honest, loyal, true friendship or forgiving).

Universalism – this value type can be related to that the farmer search for understanding, tolerance, protection and appreciation for the welfare of nature and all people (Roccas, *et al.,* 2002; Schwartz, 1992; Bardi & Schwartz, 2003; Schwartz 2005).

Bardi & Schwartz (2003) stress that values are important to consider to develop an understanding of several social psychological phenomena, therefore will the value theory fit this study when investigating the farmers cognitive structure. It can be a bit fuzzy to place the farmers' behavior into a certain group value, since peoples behaviors may express more than one certain value (*ibid*). For example, a person that is going hiking, may value both the nature (universalism value) and the adventure (stimulation value). So the purpose is to find out what the first underlying value the farmer is thinking of, which was performed by using the MEC approach.

In addition to the value theory and the ten basic values that are explained above, Schwartz (1992) stresses a relationship between the different values. Pursuing some values may have practical, social and psychological consequences that can conflict or may be matching with the chase for other values. An example can be to try to obtain both achievement values and benevolence values due to seeking success for themselves at the same time as preserving and enhancing the welfare of people who needs help. However, the chase of achievement values can be compatible with power values, in the sense that a person is seeking for own success at the same time as the person wants to strengthen his or her social position among a group of people (*ibid*).

Different backgrounds may also affect what values a person consider important to themselves. People tend to adapt their values after their life situations (Schwartz, 1992). Different life circumstances for people create different opportunities to express or pursue some values more than others. For example, people who work within free professions might have easier to express self-direction values and a wealthy person might have easier to pursue power values. Circumstances in life may sometimes impose limitations against expressing or pursuing some values (*ibid*). Additional to background and life circumstances, Schwartz (1992) emphasizes that aspects like education, gender and age also can have an impact on the values that people consider important. This could be interesting to analyze since the respondents may have different life circumstances, backgrounds, education, gender and age. Therefore, it could be important to take this into consideration when evaluating the farmers' values.

Education provides the person with an understanding for the world and other humans together with openness and flexibility, which are aspects that is essential for the self-direction values (Schwartz, 1992). The same experiences may create openness to stimulation values and non-routine ideas. Gender may also entail a difference in values since psychoanalytic theorists argues that woman have easier to make social contacts with others, than men (*ibid*). Age is associated with three sources of values changes, such as, physical ageing (e.g. loss of memory), specific age cohorts (e.g. depression or war) and life stages (having a child or widowhood). Each of these sources may have an effect of the values that a person take into consideration, for example, farmers that will come into a new life stage (e.g. having a child)

may change their priorities of values, and maybe go for a safer alternative than before to ensure the income of the farm business.

2.6 Summary and contribution to the literature

The chapter started out with a review of recent published literature in the area of risk management within the agriculture sector. The risk literature was presented in order to provide an understanding for the farm business and the importance of working with risk management by using hedging. The farm business is exposed to a lot of risks and hedging is one way to manage the price risk in the business, since the farmer can choose to sell the grain before the harvest and secure it on a level where he or she is satisfied. Previous literature revealed that some farmers tend to use hedging to a greater extent than others. This is an important aspect to take into consideration when discussing the farmers' values and motives of using hedging such as forward contracts, to see if the respondent answers match the literature.

The means-end chain theory builds an assumption that a consumers buying motives are divided in to attributes, consequences and values. The MEC approach gives the structure for the study. The personal value theory has been used in order to complement the MEC theory, this to perform a more complete analysis of the farmers' motives or underlying values of using forward contract. The personal value theory provides the study with a discussion of ten universal values where the farmers' values can be classified into a category.

Even though the hedging area is popular to study, and many studies have been performed regarding farmers benefits from using hedging instruments, there is lack of previous studies where the researchers have used the MEC approach together with the personal value theory to perform the study. So, this thesis will contribute to the literature by providing an understanding for the farmers' motives and cognitive structure in a choice of using forward contracts to mitigate the price risk. The study can thereby provide a wide understanding for other researchers' development of new studies concerning the farmers' cognitive structure in the choice of a certain hedging product. The study can thus contribute to the research by creating or developing improvements on new hedging instruments in the future.

3 Method

The method that is used in order to reach the aim of the study is presented in this chapter. The chapter starts with a description of the chosen approach for the study and continues with an explanation of the qualitative approach and the laddering interview technique. Ethical aspects, course of action and implication of the chosen theory and the technique are also motivated in this chapter.

3.1 Choice of approach

This study has been carried out with a descriptive qualitative approach with semi-structured in-depth interviews in the form of laddering. A qualitative approach is considered to be a useful approach when "*investigating the meaning of social phenomena as experienced by the people themselves*" (Malterud, 2001 p. 398). The qualitative approach was chosen since it is considered to be applicable in studies of human behavior and their actions (Allwood, 2004; Robson, 2011). This is well suited for this study since it investigates the farmers' personal motives and values of using forward contracts. In order to obtain knowledge within the research field, previously published studies has been examined, according to Bernard (2011) this is a good way to grasp an alternative focus of a study and reject or confirm previous findings. The chosen approach has been carefully selected in order to fulfill the aim of the study. Bryman & Bell (2013) described the qualitative approach as a research method that usually highlights words rather than numbers. Hence, the qualitative research method creates an image of the respondents' social reality (*ibid*), which is in line with the aim of the study, to develop an understanding for the farmers' social reality.

Semi-structured interviews in the form of soft laddering were selected in this study (Reynolds & Gutman, 1988). The choice of in-depth laddering interviews is something that was realized as positive when investigating the farmers' motives and cognitive structure. The use of laddering interviews can make it possible to understand the farmers' reasoning when it comes to the decision of using hedging. An interview is a great method to avoid possible misunderstandings, since both the researcher and the respondents have the opportunity to ask questions during the process (Kvale, 1997). An understanding for the Swedish farmers' motives of using hedging is required in order to fulfill the aim of the study. Laddering interviews are often based and established together with the MEC theory. The laddering process is used to create level-values divisions (Gutman, 1982), by analyzing the farmers means-end in their choice of using hedging.

Recent studies have proven the MEC approach to be a useful method in order to obtain knowledge of how individuals perceive different attributes, consequences and values of a certain activity (Hansson & Lagerkvist, 2015). The laddering technique is used in this study to uncover the meaning with the choice of forward contracts and reveal what underlying values and consequences that are tied to the attributes related to forward contracts. Usually the laddering technique is used to analyze the consumers' behavior in a realistic situation such as

a purchase decision, where the respondents can give instant associations with the product (Reynolds & Gutman, 1988). However, it is similar situations since the farmers are in a realistic situation where they choose to use a product instead of buy one.

The unit of analysis in this study is the farmers and their motives of using forward contracts in order to mitigate the price risk. The farmers' perception together with their values of using the product is analyzed through the MEC approach together with the personal value theory. It is important to highlight that the aim of the study is not to generalize the conclusion for all farmers' decision, but it can give a realistic picture of the reality, how a number of farmers perceive different attributes, consequences and values related to a hedging instrument. The understanding for the farmers associations between end-values, consequences and attributes are vital for the problem of the study.

The qualitative research interview is a method that is used to get the respondents view of the world and develop an understanding of their experiences (Kvale & Brinkmann, 2014). The goal of a semi-structured interview is to obtain the interviews description of the world in order to understand the meaning of the phenomenon (*ibid*). Since it is a semi-structured interview, a templet was created as a guideline for the interviews, this can help the researcher to remain focus and know what relevant questions that should be asked in order to fulfill the aim (appendix 1). Since the farmers only will be interviewed once, it is important that the researcher is well prepared and competent but still leave the control over the interview a bit open for the respondents (Bernard, 2011). The interview technique laddering was chosen to highlight the farmers own underlying values in their cognitive structure. Hence, it was chosen to get a possible knowledge or understanding of the deeper unconscious thoughts that are related to the choice of using forward contracts.

Interviews allow the respondents to express themselves by their own words, which give the researcher a chance to obtain knowledge from the respondents' behavior (Kvale & Brinkmann, 2009). It is important how the researcher construct the questions in order to avoid leading questions and ensure the validity of the study. This is also in line with the outline of the MEC approach that is suggested (Grunert & Grunert, 1995). The answers from the respondents will then be analyzed through an HVM which creates a map with links between different MEC elements. The credibility and the quality of the study will also depend on the researcher's way to interpret the answers from the respondents. By following the guideline of Reynolds & Gutman (1988) to conduct the coding of the data, the quality of the study can be ensured.

The laddering interviews will be performed as telephone interviews, which were conducted in the same way in a previous study by Hansson & Lagerkvist (2015). A telephone interview is explained by Robson (2011) as a technique where the interviewer contacts the respondents over phone, asks the prepared questions and record the interview. Robson (2011) are further stressing advantages and disadvantages with phone interviews. A telephone interview should not be longer than 30 minutes (Robson, 2011), since the soft laddering interviews in this study are short it works with telephone interviews. The approximate interview time with the farmers

was five to ten minutes depending on the answers and how dedicated the farmer was to the subject. Another advantage is that the phone interview is seen as a much quicker and cheaper alternative then other methods, which suits this study since farmers from different parts of Sweden are interviewed to get a broader picture of why they are using hedging. The researcher is aware of the disadvantages with telephone interviews, for example the lack of visual information and physical signals from the respondents (*ibid*). The telephone interview could affect the study in a negative way. If the author were not able to grasp the respondents exactly thoughts over the telephone, which could be expressed in a different way if the interview were conducted as a face-to-face interview.

Since the purpose of the qualitative method is to discover processes, structures and variations of unsatisfactory or unknown characteristics or phenomena (Starrin & Svensson, 1994). In order to increase the trustworthiness of the study it is therefore important that the farmers have varying perspectives of forward contracts, and that the researcher understand the complexity that might occur in the choice of hedging instrument. A more complete understanding of the choice criteria might develop when the researcher obtain different responses from the farmers point of view. A mix of the respondents has been chosen from different regions of Sweden to get a wider perspective of answers.

Maria Andersson at Lantmännen was contacted in order to find farmers that meet the criteria that are presented in *Aim* and *Delimitations* in chapter 1. The contact information to 567 farmers that had a production larger than 50 hectares, from different regions in Sweden was provided by Lantmännen where the farmers signed the contract. The wide range of respondents gave the researcher an opportunity to choose between and pick out farmers with different size of contract and from different regions to get a spread of answers that will increase the validity of the study. Nearly all of the respondents that was contacted for the interview wanted to participate, just a few declined with the reason that they did not have time. Having a variation of respondents in the study is confirmed by Starrin & Svensson (1994) who points out that the choice of respondents should create possibilities to understand and interpret the differences on how a group of people perceive the same phenomena.

Recently published literature with the laddering interview technique have chosen different amount of respondents. Reynolds & Gutman (1988) had a number of 67 respondents while Hansson & Lagerkvist (2015) had a number of 50 respondents in their study. Costa *et al.* (2004) stressed that a soft laddering interview is suitable for a study with less than 50 interviewees. Since it is a soft laddering approach, 30 farmers were chosen as a suitable number of respondents.

To make the farmers feel more confident and make them speak more freely about the chosen hedging instrument, the researcher had to communicate a sense of involvement in the interview. This is confirmed by Reynolds & Gutman (1988) who stressed the importance of creating a good and relaxed interview environment for the respondents. The researcher must also put aside own biases when reflecting over the reasoning and answers from the farmers (*ibid*).

3.2 Course of action

Robson (2011) emphasizes the importance of a careful preparation and planning the study. Therefore was the first step to contact the farmers and ask them if they wanted to participate in the study. Hence, the purpose of the study was explained to make sure that the farmer felt comfortable to participate and not obligated. The next step was to prepare the farmers for the interviews by asking them to think of why they are using forward contract in their business and then a further meeting for the telephone interview was booked. The planning and preparation was made so the farmers could feel more comfortable before the interview.

3.2.1 Laddering technique

"Laddering refers to an in-depth, one-on-one interviewing technique used to develop an understanding of how consumers translate the attributes of products into meaningful associations with respect to self, following means-end theory"(Reynolds & Gutman, 1988, p. 12).

The laddering technique is described as a tailored format that controls the connections between different key elements that are related to the consumer's consumption behavior (Gutman, 1982). The key elements for this thesis will be the farmers perceived attributes, consequences and values of forward contracts.

The laddering based telephone interviews were made during one week in April 2015, where 30 farmers were interviewed. An extensive range of answers was essential to conduct an informative hierarchical value map (Reynolds & Gutman, 1988). The farmers were handpicked from different regions of Sweden in order to get a broad variation of answers. Before the probing part of the interview started the farmers were asked questions about their age, education, gender, farm size, if grain production was the main occupation or if they had animals. These questions were asked in order to receive background information of the farmers. After this part, the interview continued with finding out what the characteristic attributes was for the certain product (Grunert, 1995). This was done by asking the farmer: "why did you choose to use forward contract?" Further are the consequences and values presented which occur from the question "why is these attributes important to you?" which takes the farmer one step up the ladder (Reynolds & Gutman, 1988).

This continues until the farmer is incapable to give an answer of the questions, and this is where the laddering stops and the preferred end-value is found. An example of a laddering interview is stated in Figure 6. When interviewing some of the farmers they stopped the interview by saying "it is just important to me" this means that the answer before are considered to be their most important value, so in the example in Figure the farmers value is to be able to plan a budget for the next year.

During the interviews, it happened that the farmer started with the consequence of the product and skipped the attribute. An example of this could be that they thought the price at harvest was too low, so they wanted a strategy where they could sell their grain before harvest to a higher price. This is not a problem for the interview but in some cases they jumped between attributes to values and back to consequences which gives the researcher the responsibility to interpret the answers and put them in the right order to get a completed ladder.

Interviewer: "Why did you choose to use forward contract?"

Farmer: "Because it is a way for me to avoid selling the grain at harvest" **(Attribute)**

Interviewer: "You said that you want to avoid selling your grain at harvest, why is that important for you?"

Farmer: "I think that the price of grain is lower at harvest" **(Consequence)**

Interviewer: "So, why is it important for you to get a higher price?"

Farmer: "Because I want to ensure my income" **(Value)**

Interviewer: "Why is it important to you to have an ensured income?"

Farmer: "If I know my income, I can plan a budget for my next year" **(Value)**

Interviewer: "Why do you want to plan a budget for the next year?"

Farmer: "It is just important to me" **(End)**

Figure 6, Own illustration of a potential laddering interview with a farmer regarding their choice of using forward contract, based on the questions presented by Reynolds & Gutman, 1988, pp. 794.

The answers from the laddering interview are afterwards presented in a hierarchical value map (HVM). The HVM provides an illustration of the connections between the farmers different aspects related to MEC (i.e. the attributes, consequences and the end-values of using forward contracts). According to Olson & Reynolds (2001) can the connections in the HVM provide an understanding of the consumers' behavior in a purchase decision, while in this thesis bring an understanding for the farmers' motives for using a certain hedging instrument.

According to earlier literature, there are two main types of laddering interview techniques, hard and soft laddering (Grunert & Grunert, 1995). The soft laddering technique was chosen for this study to highlight a natural flow and an appropriate value chain of the famers' cognitive structure. In contrast, the hard laddering technique forces the respondents to provide

one ladder at the time and is usually used in quantitative studies with more than 50 respondents (Grunert & Grunert, 1995; Costa *et al.,* 2004). Instead of forcing the farmers, the soft laddering technique allows for a natural discussion of the farmers' perception of attributes, consequences and values in their choice of using hedging. The chosen technique also allows the farmer to state the same reasoning for more than one ladder, which gives the researcher an opportunity to get back to the attribute and continue a new ladder. Instead the hard ladder technique is not able to follow up more than one ladder at the time (Costa *et al.,* 2004).

3.2.2 Ethical aspects

The ethical aspect is important to take into consideration since it can stress, harm or make people nervous that are involved in the research (Robson, 2011). It was therefore important to make the respondents comfortable with comments to make them feel calm in the interview situation. A relaxing comment according to Reynolds & Gutman (1988) can be that there is no right or wrong answer to the laddering question, which can help the respondents to feel more comfortable in the interview situation. Another arrangement was the presentation of the soft laddering approach, which was made before the interview started in order to calm down the respondents. The ethical aspects of this study are for example, that no respondents have been forced to participate, all have been asked to contribute voluntarily. Another example is that all information about the respondents is confidential to protect them and make them answer more freely on the questions regarding their choice criteria of using forward contracts.

The respondents may feel more confident and answer in a more reliable manner by assuring these ethical issues about confidentiality (Kvale, 1997). The analytical part of the interview should be shaped in a way so the farmers feel stimulated to provide more information to the subject area. By using the echo probe technique (i.e. repeating the last part of the respondents answer) it shows that the interviewer is informed and understands the answer. The technique is supported by Reynold & Gutman (1988) who stresses that the echo probe technique can help to confirm the respondents answer.

3.2.3 Problems encountered during the laddering interviews

Even though the chosen approach is suitable for the study, there are limitations that are connected to the framework that has to be considered when evaluating and conducting the results. Reynolds & Gutman (1988) stresses two main problems to consider when using the laddering interview technique.

The first is if the respondents do not know what to answer when they are asked about the attributes or consequences of a product. This scenario can be dealt with by reformulate the question e.g. "what would happen if the attributes or consequences were not available?" this example is explained by Reynolds & Gutman (1988) as negative laddering, where the respondents are referring the product to a negative situation. The farmers were well prepared before the interview took place in order to avoid the first problem (i.e. the respondents have

problems of knowing what to answer). The famers were first contacted in order to book a time for the upcoming interview, during the first contact, they got information about the thesis and the interview technique together with the approximate time for the interview which was estimated to five to ten minutes depending on their thoughts and motives. The farmers were also asked to think of their motives of using the forward contract and why they are using it, to feel more prepared for the interview.

The second problem with laddering is that the interview can be too personal, when asking about "why are these attributes important to you?" then the respondents may avoid the answer by attaching adverse or negative aspects to the interviewer or the interviewing process (*ibid*). To avoid this situation, the researcher can try to move the conversation to a third person perspective, such as playing a role (*ibid*). To avoid the problem of being too personal in the interview, the researcher took notes when the farmers had problem to answer the question and got back to it in a later situation with a reformulated question to try to reach the farmers personal value of using the product.

Another limitation that has to be considered is that there are no clear instructions in recent literature of the differences among attributes, consequences and values of a subject. Due to the absence of guidelines in previous studies, the result of the interviews are based on the researchers own interpretation of the answers of what an attribute, value or a consequence means to the farmer. Another problem that may occur is that the farmers may misunderstand the connection between the attributes of forward contracts and the consequences that the product is providing them with.

A problem that was encountered during the interviews was that the farmers jumped between values and consequences and they were not always following the laddering structure. The answers were then interpreted and placed in a certain order by the researcher to get a structure and a similarity between all the answers. Another problem was that the farmers had about the same answer but formulated it differently which can lead to a lot of attributes, consequences and values with the same meaning. Therefore, has some of the answers been merged into one keyword that is covering the meaning of all of them, some of these words can be found in the Appendix 3.

3.2.4 Coding the laddering interviews

To get a more manageable amount of results, the answers from the laddering interviews were coded into attributes, consequences and values (Reynolds & Gutman, 1988). It is important to have a wide range of classifications in order to find connections between attributes, consequences and values. But it is important to not be too wide, since important information can fall in between different classifications. The classifications that are made out of the results are relatable to the studied subject.

LadderUX is a computer program that was used in order to analyze the results from the laddering interviews. The program provides an understanding for the connections between

values, consequences and attributes of forward contracts. It is of importance to highlight that it is not the actual value, attribute or consequence that is of interest for the analysis but instead the connections and the links between the different elements. When the classifications are made and placed in LadderUX, a HVM can be developed to see what values that have been mentioned most times during the interviews. The links between the elements in the HVM are divided into direct and indirect links between the answers. Direct links are the direct association between two elements made by the farmer and indirect links are the links that are based on a general assumption of the farmer between two elements. A connection between different elements must have been mentioned a certain number of times by the farmer to be illustrated in the HVM, this is made to get a higher quality of the HVM and is described by Reynolds & Gutman (1988) as the *cut-off values*.

4 Analysis and Results

The findings and the results from the laddering interviews with the farmers are presented in this chapter. The results are presented and analyzed in a HVM that is based upon the outline of the MEC approach. A HVM is created in order to understand the farmers' motives of using the hedging instrument; forward contracts.

4.1 Background of the empirical study

The 30 farmers that participated in the interviews were chosen from different production areas in Sweden. The localizations of the farmers are presented in Figure 7, where *n* represents the number of farmers that was interviewed in each region. Twenty-nine male and one female farmer were interviewed with an age range between 28 and 69 years old (avg., 53.27) and (std., 10.41 years).

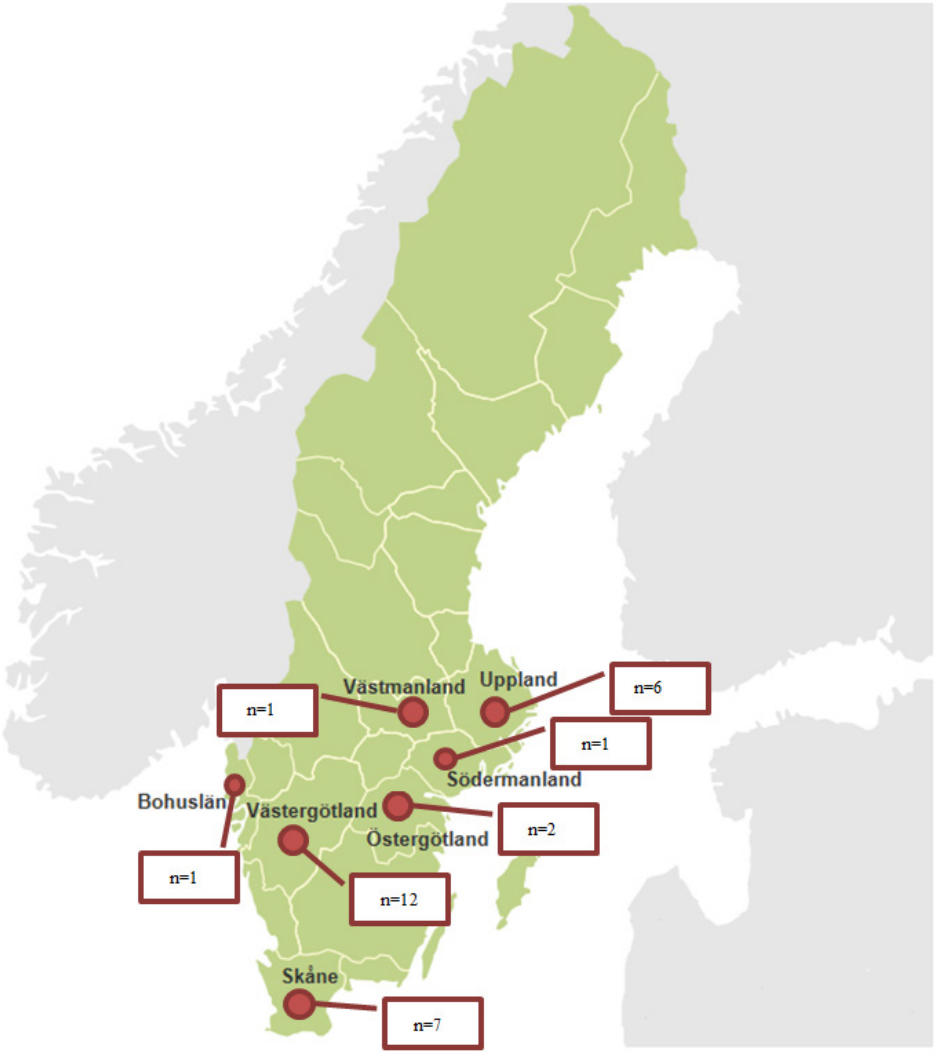

Figure 7, Localization of the respondents that participated in the laddering interviews (Own illustration).

The interviewed farmers came from different production areas in the south part of Sweden. 7 farmers came from "*Skåne*", 12 farmers from "*Västergötland*", 2 farmers from "*Östergötland*", 1 farmer from "*Bohuslän*", 1 farmer from "*Södermanland*", 1 farmer from "*Västmanland*" and 6 farmers from "*Uppland*". The farmers were chosen in order to give a spread to the study and represent the largest production areas in Sweden.

Approximately half of the interviewed farmers had a university degree from the Swedish university of agricultural science (SLU) (16 of 30). Although the majority of the respondents had a university degree, most of the farmers had some previous experience from farming, either previous working experience within the production or being a farm manager on another farm. Nine of the farmers had animals to spread the risks on the farm, where pig production was the major production. The farm size among the farmers differed from 80 to 1200 ha with an average value of 407.33 ha, a median value of 360 ha and a standard deviation of 265.32 ha. This at the same time as the size of the contract (i.e. the size of the forward contract the farmers made with Lantmännen during 2014) differed from 300 000 kg to 2 230 000 kg with an average value of 817 600 kg, a mean value of 680 000 kg and a standard deviation of 457 841 kg. Descriptive statistics from the farmers can be seen in Table 2. More information and calculations about the farmers can be found in appendix 2.

Table 2, Statistics of the 30 interviewed farmers.

	Average value	Median	Standard deviation
Gender (1 if male; 0 if female)	0.97	n/a	n/a
University degree (1 if Yes; 0 if No)	0.53	n/a	n/a
Diversification (Animals) (1 if Yes; 0 if Not)	0.3	n/a	n/a
Age	53.27 years	56 years	10.405 years
Hectare	407.33 ha	360 ha	265.32 ha
Size of contract	817 600 kg	680 000 kg	457 841 kg

4.2 Result and analysis of the HVM

By analyzing the laddering interviews with the 30 farmers, the author was able to recognize a total number of 99 ladders, this resulted in an average on 3.3 ladders per farmer, and each ladder consisted of an average of 3.47 elements. The low number of ladders that was provided by each farmer can be related to the number of reasons why the farmers are using forward contracts. However, not all of the interviews were complete ladders from attribute to value, but instead begun or was ended at the consequence level. A total number of 35 MEC elements (attributes, consequences and values) and 462 links (245 direct links and 217 indirect links) between these was identified. However, some of the definitions of the elements was closely related and therefore merged together to a master code (Appendix 3). Some farmers mentioned the element "Earn as much money as possible" as a description of what forward

contract means to them. This element was then recorded as an attribute for those. Other farmers mentioned the element "Earn as much money as possible" as a consequence or a value related to another attribute of using forward contracts. This proposed different levels of abstraction of the farmers' view of forward contracts.

A critical issue when conducting a HVM is the choice of cut-off values, this is referred to as the number of times a certain element has to be mentioned by the respondent in order to appear in the HVM (Reynolds & Gutman, 1988). In order to get a HVM that fits the study and the collected data there has to be a compromise between a high and a low cut-off value. The high cut-off value will give a more general HVM to interpret while the lower cut-off value will give a more detailed HVM with more data included. Researchers suggest different cut-off values depending on how many respondents that is included in the research. A recommended cut-off value for a research including 50-60 respondents is between 3 and 5 (Reynolds & Gutman, 1988). Leppard *et al.* (2004) suggest that different elements require different cut-off values, since elements are mentioned more or less than others. Even though, the approach described by Leppard *et al.* (2004) is attractive and flexible, it could be difficult to implement in this thesis since the farmers had different views of attributes and consequences, and an attribute for one farmer could be a consequence for another. Therefore, in this thesis the same cut-off value has been used for all the elements through the HVM.

Gengler *et al.* (1995) used a cut-off value at 5% of the sample, which in this study would be a cut-off value at 1.5. Instead the author evaluated different cut-off values between 1 and 4, which resulted in a cut-off value at 2. In this study, a cut-off value at 6.67% of the sample was chosen. A cut-off value at 2 gave a good balance between enough information and complexity in the HVM and a value of 68.83% of the links and 51.71% of the cells included in the HVM. The resulting HVM is showed in Figure 8, in which the links that are mentioned more than 10 times are marked in bold to indicate the importance of the element. By using a cut-off value at 2, the researcher could identify four attributes, ten consequences and six end-values in the HVM (Figure 8). Usually the HVM goes from attribute to consequences and from consequences to values (Reynolds & Gutman, 1988). But in a complex HVM the attributes can be linked directly to the values or even start at the consequence. The HVM should however be read from the bottom to the top, since the outlines of the ladders are going from attributes through consequences to the end-values.

The HVM provides a presentation of the farmers' motives of using forward contracts and the most important MEC elements (attributes, consequences and values) that is considered by the farmers. The number presented in the squares is the number of times an element has been mentioned by the farmers (direct and indirect), the numbers are provided to get an understanding for what elements the farmers are considering most important in their choice of using forward contracts (Veludo de Oliveira *et al.,* 2006). The number of times an element has been mentioned direct or indirect is explained in the implication matrix (appendix 4). The implication matrix is the basis for the results and from which the HVM emerges.

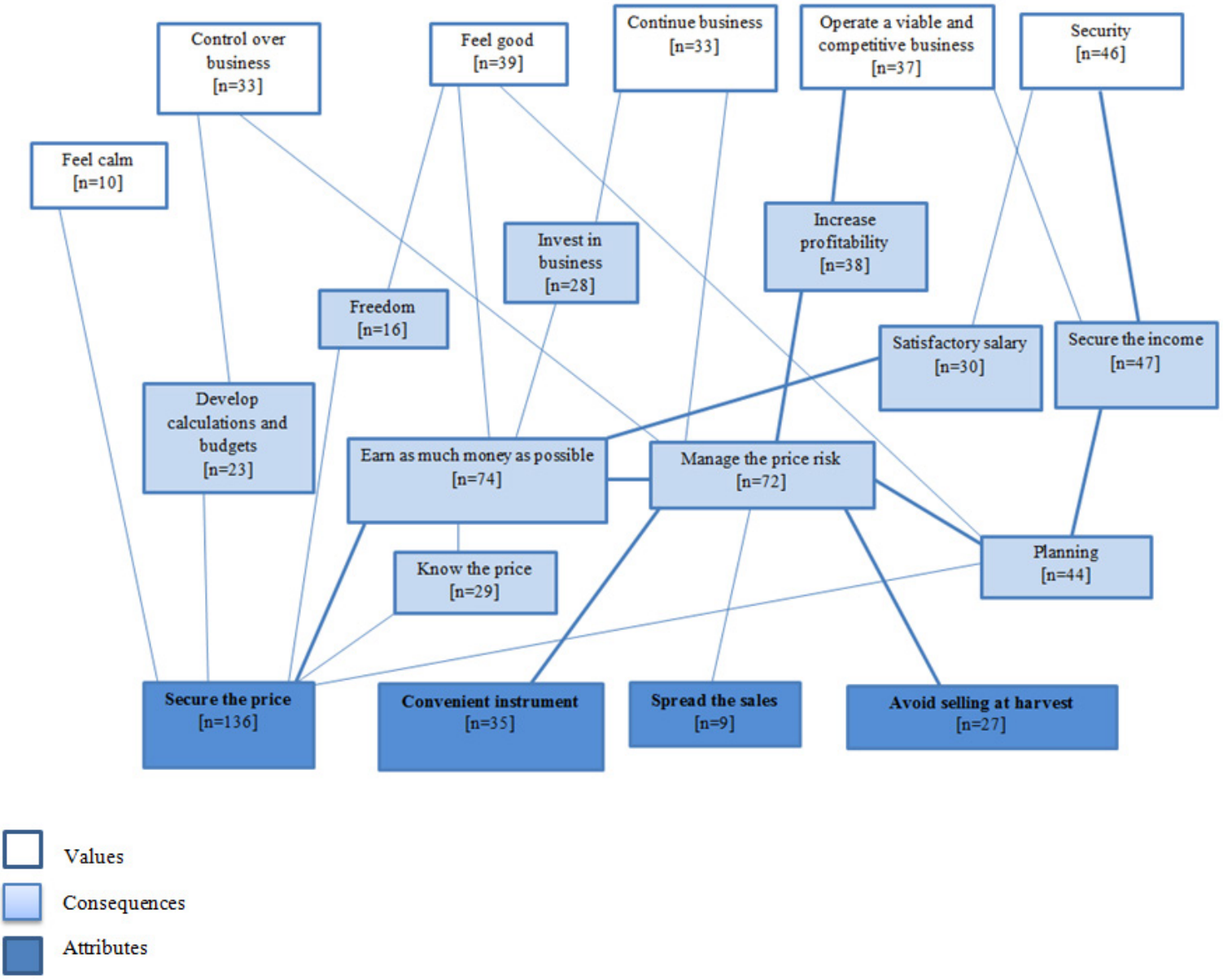

Figure 8, Hierarchical value map (own illustration based upon the information from Ladderux).

According to the HVM, the interviewed farmers view forward contracts as being based on the following attributes: "Secure the price", "Convenient instrument", "Spread the sales" and "Avoid selling at harvest". The attributes are presented in bold in the bottom of Figure 8. Most of the farmers that perceived forward contract as a "Convenient instrument" thought the instrument was efficient or suitable for their strategy. The difference in farmers' perception of "Spread the sales" and "Avoid selling at harvest" was that "Spread the sales" were related to sell opportunities both before and after harvest, while "Avoid selling at harvest" was focusing on not selling during the harvest period while the price tends to go down.

The farmers' perceptions of the attributes related to forward contracts were mostly tied to their gain of using the hedging instrument. Most of them pointed out "Secure the price" as the most important attribute of using the product. Some farmers wanted to "Spread the sales"

during the harvest year, both before and after harvest. Some of the farmers was using the instrument for the first time and thought it was a convenient instrument. And others wanted to avoid selling at spot price during the harvest period. “Secure the price” is considered to be the main attribute as it was mentioned most times by the farmers.

The consequence that was provided by the farmers in the HVM was: “Earn as much money as possible”, “Manage the price risk”, “Develop calculations and budgets”, “Freedom”, “Invest in business”, “Increase profitability”, “Know the price” (i.e. “know what price I could get from selling the grain”) , “Satisfactory salary”, “Planning” (i.e. “plan my financial result, and thereby my business input and output”) and “Secure the income”. However, “Earn as much money as possible” and “Manage the price risk” is considered to be the main consequences and mentioned most times directly and indirectly by the farmers.

The three attributes: “Convenient instrument”, “Spread the sales” and “Avoid selling at harvest” were leading, directly or indirectly, to the consequence “Manage the price risk”. The fourth attribute “Secure the price” is leading, directly to the consequence elements “Know the price”, “Earning as much money as possible” and indirectly to “Manage the price risk”. Further, “Secure the price” is linked to the consequence “Develop calculations and budgets”, “Freedom” and “Planning”, which in turn is leading to other consequences and values. For instance, the consequence “Develop calculations and budgets” leads to the value “Control over business”, while the consequence “Freedom” is leading to the value “Feel good” and “Planning” which in turn leads both to another consequence “Secure the income” and the value “Feel good”. Further, “Secure the income” is leading to the values “Security” and “Operate a viable and competitive business”. The attribute “Secure the price” is also leading directly to the value “Feel calm”.

The consequence “Earn as much money as possible” was related to the farmers’ perception of maximize profit and minimize losses. It further leads directly to the consequence “Satisfactory salary” which in turn leads to the value “Security”. “Earn as much money as possible” leads directly to the value “Feel good” and indirectly to the consequence “Invest in the business” which leads to the value “Continue business”. The consequence “Manage the price risk” is leading directly to the values “Control over business” and “Continue business”, but also to the consequence “Increase profitability”, which in turn leads to the value “Operate a viable and competitive business”.

It should be noted that “Feel calm” is the only element without a link to a consequence and is therefore going straight from attribute to value. Another notable aspect is that some of the elements were used both as consequences and values by the farmers. For instance, “Invest in the business”, “Increase profitability” and “Satisfactory salary” were both perceived as values and consequences by the farmers. Some farmers were mentioning these as the preferred end-value but not as their personal value, instead as a business value or a psychosocial consequence of another consequence. However, since these elements most times were means to some further ends they are considered as consequences in the HVM. It is however

interesting that there was consequences linked to each other. But not surprisingly since the farmers both provided functional- and psychosocial consequences in their ladders.

By looking at the strongest links in the HVM (the bold links), it appears that they are going from the attributes or elements: “Secure the price” to “Earn as much money as possible”. Further, from the attributes “Convenient instrument” and “Avoid selling at harvest” to “Manage the price risk”. There is also a strong link between the elements “Manage the price risk” and “Earn as much money as possible”. From “Manage the price risk” there are strong links to both “Planning” and “Increase profitability”. An interesting aspect is that there is a strong link between “Know the price” and “Satisfactory salary”, and almost all farmers that said they wanted to know the price also wanted a satisfactory salary. The strongest links from consequences to values are going from “Increase profitability” to “Operating a viable and competitive business” and between “Secure the income” to “Security”.

Another interesting analysis that will be further discussed against the personal value theory is the number of times the different values has been mentioned both direct and indirect during the interviews (Table 3). The three values that have been mentioned most times are: “Security” (n=46), “Feel good” (n=39) and “Operate a viable and competitive business” (n=37).

Table 3, The total number of times a value has been mentioned during the interviews (own illustration).

End-value	Number of times mentioned (direct & indirect)
Feel calm	N = 10
Control over business	N = 33
Feel good	N = 39
Continue business	N = 33
Operate a viable and competitive business	N = 37
Security	N = 46

The end-values that was perceived by the farmers and suggested in the HVM are: “Feel calm”, “Control over business”, “Feel good”, “Continue business”, “Operate a viable and competitive business” and “Security”. The values are the preferred end-state by the farmers in each ladder. Those are also the values that are interesting for the study, since they are providing an understanding for the motives of using the hedging product.

4.3 Summary

The results are based upon in-depth laddering interviews with 30 farmers from different production areas in the south part of Sweden. By analyzing the implication matrix and

looking at the HVM in the computer program *Ladderux* the author could gain knowledge of the farmers' motives of using the hedging instrument, forward contract. A cut-off value was chosen at 2 which gave a complex but interpretable HVM.

The results from the laddering interviews in the HVM showed that there were four attributes that the farmer were thinking of and the reason why they are using forward contracts, the attributes are: *Secure the price, convenient instrument, spread the sales and avoid selling during the harvest period.* From these four attributes, six consequences appeared as the consequences of the use of the product. The two major consequences are: *Earning as much money as possible* and *manage the price risk.* Nearly all of the values were connected with these two consequences in some way. The six values that the farmers thought were most important in their choice of using forward contracts are: *Feeling calm, having control over the business, feeling good, being able to continue the business, to operate a viable* and *competitive business and security.*

5 Discussion and Conclusion

The results and analysis from chapter 4 will be discussed in this chapter together with previous literature and theories in the subject area to get a deeper understanding for the most important parts of the results. Implications and interesting thoughts that have arisen from the study and the outline will be discussed together with a presentation of future studies.

Today's farmers are constantly affected by fluctuating prices on grain (Da Silveira *et al.,* 2014). The volatile prices of grain increase the price risk, and thereby the profitability of the farm business. The fluctuating prices together with the increased price risk within the farm business have opened up the market for hedging instruments to mitigate the price risk. Although previous studies have been conducted related to hedging, there is lack of studies investigating the motives that guide the farmers' choice of using hedging as an instrument to mitigate the price risk.

The aim of this study was to identify the farmers' underlying values and motives of using hedging and forward contract in their business strategy. The MEC approach together with laddering interviews has been used in order to analyze the farmers' cognitive structure in their choice of using the product. To accomplish a more suitable approach and a more detailed analysis for the study, the personal value theory is used as a complement to the MEC approach in order to analyze the farmers' end-values. The findings from this study can thus provide an understanding for the farmers' motives of using hedging. Since the study takes 30 farmers into consideration, it must be highlighted that the intention of the study is not to generalize the conclusion for all farmers' motives that use hedging, but rather to give a picture of the reality, how a number of farmers perceive different attributes, consequences and values related to forward contracts. Further, it is understood that the results from this thesis are not possible to use in order to evaluate other hedging instruments or products, since the farmers' values are tied to their perceptions of using forward contracts.

Previous studies have investigated what benefits the farmers could gain from using hedging instrument as a strategy to mitigate the price risk within their business (Da Silveira *et al.,* 2014; Nilsson, 2001). Even though hedging has been a highly interesting studying last years, there are no previous studies on the farmers underlying values and motives of using hedging, by applying the MEC approach together with laddering interviews. Compared to the use of previous researches related to hedging, the study has followed the outline recognized from the MEC approach (Reynolds & Gutman, 1988), to get a deeper understanding for the farmers underlying values in their use of hedging instrument, the personal value theory has been investigated (Schwartz, 1992; Bardi and Schwartz, 2003; Schwartz, 2006). By using this approach, the study could investigate the farmers' cognitive structure and their underlying values in their choice of using hedging and the product forward contracts. The MEC approach allowed the author to do in-depth laddering interviews with the farmers about the values they consider when working with hedging, and how working with hedging could fulfill these values. However, this study will lay as a basis for further investigation on the subject of

farmers underlying values and motives in their choice of using hedging as an instrument to mitigate the price risk.

The interviewed farmers did not always mention the ladder from a straight line perspective, which is described to start with the attribute and ended with the value (Reynolds & Gutman, 1988). Instead, some farmers chose to start the interview with the consequence or the value as their first thought or perception of forward contracts. This could probably be affected by the farmers' knowledge of forward contract and already had an elaborated idea of the use. This did not affect the outcome of the study, since the author asked a supplementary question, in order to get the farmer back on track. Further, this is probably common in situations where the respondents are thinking one or two steps further, why they are choosing to confirm a certain action or choosing a certain product. The main reason for using forward contract could be to have control over the business, which is considered as a value, and therefore the first thing that the farmers are thinking of.

5.1 The HVM

The analyzed data in the HVM, collected from the laddering interviews, suggested two consequences "Earn as much money as possible" and "Manage the price risk" to constitute a central role in the HVM. These two consequences are considered to have large impact on the farmers' decision making related to hedging and forward contracts. These were the consequences that was mentioned most times by the farmers both direct and indirect, during the interviews ("Earn as much money as possible" (n = 74) and "Manage the price risk" (n = 72). Beside these two consequences, there were eight others that appeared from four attributes. These ten consequences are considered both as functional- and psychosocial consequences.

By dividing the different consequences into functional and psychosocial consequences it is easier to separate them from each other (Peter & Olson, 2010). The functional consequences (i.e. the consequences that are directly tied to the use of the product) are: "Develop calculations and budgets", "Manage the price risk", "Increase profitability", "Know the price" and "Secure the income". The psychosocial consequences (i.e. a benefit that depends on another consequence and what the farmer is gaining from using the product) are: "Earn as much money as possible", "Freedom", "Invest in the business", "Satisfactory salary" and "Planning". The psychosocial consequences are more closely related to the values but not always necessary perceived as the end state by the farmer. From these ten consequences, six end-values appeared. The end-values can be divided in to; terminal and instrumental values (Rokeach, 1973), where instrumental is related to behavioral patterns and terminal to preferable end-states of reality. Most of the end-values with respect to hedging in this thesis are related to terminal values (e.g. happiness or security), and not to the behavior patterns (e.g. honesty or courageous) (*ibid*).

The strongest links in the HVM (i.e. the links mentioned most times by the farmers) are considered to be the main links in the study. The most important links are marked in bold

(Figure 8). First, the HVM suggested the attribute "Secure the price" (n = 136) to be the most important attribute. Further, the HVM suggested the two main consequences "Earn as much money as possible" and "Manage the price risk" to lead both directly and indirectly to other consequences and values. The main link from the consequence "Earn as much money as possible" was leading to the consequence "Satisfactory salary". This was not the preferred end-state for the interviewed farmers since the ladder later continued to the end-value "Security". The underlying value for the farmers that wanted to earn as much money as possible was to achieve security.

From the consequence "Manage the price risk" there were two main links to other consequences. The first link was connected with "Increased profitability" which in turn was connected to the end-value of "Operating a viable and competitive business". The first link indicates that the underlying value for some farmers that mentioned "Manage the price risk" as an important factor was to attain to "Operate a viable and competitive business". The second link from "Manage the price risk" were leading to the consequence "Planning" which in turn was leading to a third consequence "Secure the income" and after, to the end-value "Security". Another underlying value for the farmers that chose "Manage the price risk" as a consequence was to achieve the end-value "Security".

The HVM suggested six underlying end-values from the farmers' cognitive structure related to forward contracts; "Feel calm", "Control over business", "Feel good", "Continue business", "Operate a viable and competitive business" and "Security". In this thesis, the end-values have been analyzed from a personal value perspective, and placed into universal value groups (Schwartz, 2006; Bardi and Schwartz, 2003; Schwartz, 1992), there are, however, values that are not linked directly to the farmer as an individual. This means that farmers viewed hedging as being a value in itself or a value for something else, although these values are not linked directly to the farmers' personal welfare. The farmers are using the values to improve their farm and thereby fulfill another value. The values that are more related to the farm as a business and not to the personal welfare are therefore referred to as business values for the farmer. The value, "Operate a viable and competitive business" (n = 37) is a value that is more likely to be presented as a business value than a personal value for the farmer. It could be argued that the value work in order to fulfill the personal value of *Achievement* (Schwartz, 1992) which is related to the farmers willingness to achieve personal success by performances linked to social norms such as being seen as ambitious or intelligent. However, the farmers did not go further up, all the way up the ladder and stopped at the value "Operate a viable and competitive business" which in this study are more likely to be presented as a business value.

The other end-values that were suggested by the HVM are relatable to the personal value theory. The values "Feel calm" (n = 10) and "Feel good" (n = 39) are related to the personal value; *Hedonism* (Schwartz, 1992). *Hedonism* is described by Schwartz (1992) as a value to reach satisfaction or enjoying life. This was something that was mentioned by the interviewed farmers and included in the master codes (appendix 3). Further, "Feel good" could be argued to fit in the value group *Self-direction*, since the consequence "Freedom" was linked to the

value. This is confirmed by Schwartz (1992) who describes *Self-direction* as a goal of having independent thoughts and actions (e.g. creativity or freedom).

According to the personal value theory, the farmers perceived end-value "Control over the business" (n = 33) is likely to be classified into the value group; *Power. Power* is described by Schwartz (1992) as an individual wanting to achieve control over resources or people. The interviewed farmers described the value "Control over business" as something they wanted to achieve and therefore is this value related to the personal value instead of being seen as a business value. *Power* is further associated with having social power or social status among others (Schwartz, 1992), this was something that did not appear during the interviews but maybe an underlying value that the farmers have difficulties to communicate. Hence, the personal value *Power* is related to being wealthy (*ibid*), which is something that appeared during the interviews as a reason for using hedging.

"Continue business" (n = 33) is a value that can be argued to be a bit "fuzzy", since the value could be classified into different value groups depending on the purpose of the answer. However, some of the farmers mentioned the end-value "Continue business" in the context of a security, in order to receive the goal of family security which is further related to have a continuing income from the business, this value are therefore related to the personal value group; *Security* (Schwartz, 2006). *Security* is explained by Schwartz (2006) as a value for the individual to receive stability and harmony for themselves or in a relationship. The reasoning to continue the business in order to achieve security for the family, could also be related to the personal value group; *Benevolence* (Schwartz, 2006). This value group is explained as a goal for an individual to be helpful and loyal to a group of people, which in this case could be considered to be the family of the farmer. Other farmers presented the end-value "Continue business" as a reason for them to achieve personal success and be able to continue the business in order to avoid bankruptcy and looking bad in front of other farmers. This argument means that the preferred end-value of "Continue business" could be classified into the value group; *Achievement* (Schwartz, 2006).

The last underlying end-value that was mentioned by the interviewed farmers was "Security" (n = 46), which is directly related to the personal value group; *Security* (Schwartz, 1992). The end-value "Security" appeared from the consequences "Satisfactory salary" and "Secure the income", these consequences explains the way the farmers looked at the end-value "Security". The farmers wanted to achieve security in their business by securing the income in order to feel safe. It is interesting that the consequence "Satisfactory salary" is linked to "Security" as it could be considered a value itself.

By looking at the farmers' end-values in the HVM, together with the links and the number of times each value has been mentioned in the interviews (direct and indirect), the author could present the three most important values. The end-values that were mentioned most times was "Security" (n = 46), which was related to the personal value; *Security* (Schwartz, 1992). The second most mentioned end-value was "Feel good" (n = 39), this value was related to the personal value; *Hedonism* (*ibid*). The third most mentioned end-value was "Operate a viable

and competitive business" (n = 37), which could both be seen as the personal value; *Achievement* (*ibid*), but also to a value that has a different meaning for the farmer, such as a business value, where the farm business is in focus and not the farmers personal welfare. By concluding these preferred end-values, it could contribute to companies' work of maintaining market shares and knowledge of farmers' perceptions of using hedging instruments.

5.2 Contribution

The study is mainly directed to companies like Lantmännen and other trading companies that provide hedging instruments. In the end the farmer can benefit from getting a suitable hedging instrument that is designed according to the farmers' perceptions and values. By understanding the farmers' values and the expected product attributes of forward contracts, it can help the companies to satisfy the farmers' needs when it comes to choosing between hedging instruments. The obtained knowledge of the studied problem can also contribute as guidance for companies when thinking of advertising, starting new campaigns or implement new hedging tools. The findings from this study can further be discussed in researches with other hedging instruments to see if: (1) there are similarities due to the factors of choosing a hedging tool or (2) if there are other factors involved.

Further, the study can work as guidance for farmers that are planning to work with hedging instruments to mitigate the price risk. These farmers could then see why other farmers are using hedging, and what values they take into consideration and want to fulfill by using the product.

5.3 Future studies

A more comprehensive study with more respondents would increase the validity of the study. Therefore, a quantitative study by using the hard laddering technique is suggested. By using this approach, the results from the study could be generalized, as the method is practiced on a larger group of respondents. To verify the results, a new study could be repeated with the same respondents after six months to see if there are similarities or differences in their answers. Further, other agricultural products such as: other hedging instruments (e.g. future contracts), farm machineries or tractors could be analyzed by using the MEC approach, to see what the farmers motives are for using a certain tractor.

The approach could also be used to compare different aspects. It would be interesting to take an international perspective and compare Swedish and Danish farmers' motives of using hedging, to grasp differences between the farmers in each country.

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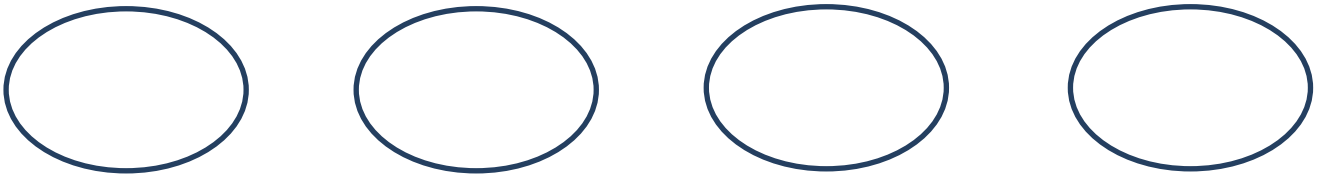
Personal messages

Maria Andersson
Purchasing Coordinator / Product manager of cereals, Lantmännen Lantbruk
Personal meeting, 2015-01-12,
E-mail, 2015-03-16

Appendix 1: A template for the interviews

Laddering probe echo part

Attribute Consequences Values End-value



Name

_____

Gender Male Female

Age

_____

Farm size

_____

Education/Experience

_____

Geographical position

_____

The main activity on the farm

_____

Appendix 2: Statistics of the respondents

Farmer (nr.)	Gender	Age	Higher education	Hectars	Anmials	Size of contract (Kg) 2014	
1	Male	56	No	80	No	300 000	
2	Male	39	Yes	400	Dairy cows	582 000	
3	Male	34	Yes	450	Slaughter pigs & Hens	430 000	
4	Male	62	Yes	130	No	400 000	
5	Male	50	Yes	600	No	1 470 000	
6	Male	57	Yes	465	Cattle production	1 228 000	
7	Male	52	No	220	No	955 000	
8	Male	69	Yes	160	No	400 000	
9	Male	52	No	350	Dairy cows	1 045 000	
10	Male	65	No	230	No	300 000	
11	Male	64	Yes	220	No	500 000	
12	Male	50	No	500	Slaughter pigs	1 542 000	
13	Male	58	No	440	No	450 000	
14	Male	57	No	520	No	484 000	
15	Male	47	Yes	1200	No	1 376 000	
16	Male	56	Yes	650	No	430 000	
17	Male	64	No	450	No	710 000	
18	Male	62	Yes	200	Pigs	542 000	
19	Male	49	No	270	No	841 000	
20	Male	30	Yes	300	No	755 000	
21	Male	59	No	300	No	1 610 000	
22	Male	28	Yes	400	Cattle production	720 000	
23	Male	64	Yes	940	Slaughter pigs	2 230 000	
24	Male	56	No	1000	No	1 083 000	
25	Male	61	Yes	135	No	650 000	
26	Female	52	Yes	220	No	900 000	
27	Male	47	No	370	Pigs	1 070 000	
28	Male	43	No	160	No	405 000	
29	Male	67	No	190	No	520 000	
30	Male	48	Yes	670	No	600 000	
Average		53,27	16 of 30	407,33	9 of 30	817600	
Mean		56,00	X	360,00	X	680 000	
Std		10,405		265,320		457841	
		N		N		N	
		28	638,4	80	107147,1	300 000	267909760000,0
		30	541,3	130	76913,8	300 000	267909760000,0
		34	371,2	135	74165,4	400 000	174389760000,0
		39	203,5	160	61173,8	400 000	174389760000,0
		43	105,4	160	61173,8	405 000	170238760000,0
		47	39,3	190	47233,8	430 000	150233760000,0
		47	39,3	200	42987,1	430 000	150233760000,0
		48	27,7	220	35093,8	450 000	135129760000,0
		49	18,2	220	35093,8	484 000	111288960000,0
		50	10,7	220	35093,8	500 000	100869760000,0
		50	10,7	230	31447,1	520 000	88565760000,0
		52	1,6	270	18860,4	542 000	75955360000,0
		52	1,6	300	11520,4	582 000	55507360000,0
		52	1,6	300	11520,4	600 000	47349760000,0
		56	7,5	***350***	3287,1	***650 000***	28089760000,0
		56	7,5	***370***	1393,8	***710 000***	11577760000,0
		56	7,5	400	53,8	720 000	9525760000,0
		57	13,9	400	53,8	755 000	3918760000,0
		57	13,9	440	1067,1	841 000	547560000,0
		58	22,4	450	1820,4	900 000	6789760000,0
		59	32,9	450	1820,4	955 000	18878760000,0
		61	59,8	465	3325,4	1 045 000	51710760000,0
		62	76,3	500	8587,1	1 070 000	63705760000,0
		62	76,3	520	12693,8	1 083 000	70437160000,0
		64	115,2	600	37120,4	1 228 000	168428160000,0
		64	115,2	650	58887,1	1 376 000	311810560000,0
		64	115,2	670	68993,8	1 470 000	425625760000,0
		65	137,7	940	283733,8	1 542 000	524755360000,0
		67	188,6	1000	351253,8	1 610 000	627897760000,0
		69	247,5	1200	628320,4	2 230 000	1994873760000,0
			3247,9		2111836,7		6288545200000,0

Appendix 3: Merged answers from the interviews

Lock the price of grain at a certain level -> Secure the price to get a fixed price -> Secure the price at a level where I am satisfied -> Secure a part of the volume ->	**Secure the price of grain**
Get the best possible price out of the instrument -> Best possible price ->	**Chasing the best possible price**
Secure the result -> Secure the income ->	**Steady income**
Easier to make calculations -> Work a lot with calculations ->	**Make calculations and budgets**
Know my income -> Know how much money that comes in ->	**Secure the income**
Feel free to do whatever I want -> Have a life besides farming ->	**Freedom**
Maximize income and minimize losses -> Earn the most money that is possible -> Maximize revenue ->	**Earn as much money as possible**
Feel good -> Sleep well at night -> Have a good life -> Good personal life ->	**Feel Good**
Interesting -> Excitement ->	**Interesting**

Manage the price risk ->
Minimize the price risk -> **Manage the price risk**
Spread the risks ->

Convenient instrument ->
A good instrument to know what price to get ->
One of the few ways to secure the price -> **Convenient way to secure the price**
Easy way to secure the price ->

Operate a viable business ->
Operate a competitive business -> **Operate a viable and competitive business**
Make the farm go as good as possible ->

Longer selling period ->
Spread the sales -> **Spread the sales**

Invest in the business -> **Invest in the business**
Develop the business ->

Appendix 4: Implication matrix

NAME= Farmers motives of using forward contracts

IMPLICATION MATRIX

Secure the price	everything	ment to	lead the s	hig the be	steady incom	and oth	calculation	orate the h	money	ge the pl	ease profit	Planning	the price	te from d	ejuvating	phase effic	affect the	ow the pi	ure the in	interesting	Exciting	inue Busi	d over bu	Feel calm	Security	in the bu	Freedom	Feel good	factory s	and com	Heritage	prio view	od family	to fluctua	sum
Secure the price of	10	210	11	5 3	210	718	X10	11 5																										01	54182
Avoid selling everything at harvest		01			210	11	60	01	01	01	01								10	10		01			03	01	01	02		01					1115
Convinient instrument to secure the price			10	210		01	50	02	14							10	10		20	01			01		03	01		02	10	02	01			01	1419
Spread the sales						02	30																01		01	01									36
Chasing the best price			10			20	10	11	01								10		10		01		01		01		01	01	11	02			01		89
Steady income			20		10																	01	11		01	10	10								63
Pay debts and other outputs						20				20												02	10		01			11							84
Develop calculations and.											20						02		11			10	30	11	10	10				10					114
Eliminate the risk						10																			10	01				01					32
Earn as much money as possible								60	21	01	10					03	21					21	20		11	31	11	32	50	30	01		10		3217
Manage the price risk									41	40	10	10					11	10		14		21			04	02	01	11	01	32		01	01	01	2021
Increase profitability										10	10						10	20		14		10			11			10	11	41	01			10	1414
Planning										10							20	20				20	01	50				212					01	1885
Meet the price peaks																				10								01		01					12
Free from debts																				10							10	20							40
Fluctuating prices																																	10		10
Increase efficiency																																			00
Fun to affect the price																					10	10													20
Know the price																			30				01	11	02	02				12					5110
Secure the income																							02	10		22	11		02	01	13	01			5112
Interesting																																			00
Exciting																																			00
Continue Business																										30	10	10							50
Control over business																								20	20					10		01			51
Feel calm																																			00
Security																											10	10	40						60
Invest in the business																													20						20
Freedom																													30	10					40
Feel good																														01					01
Satisfactory salary																																			00
Operate a viable and competitive business																																20	10		30
Heritage																																			00
Optimistic view of the.																																			00
Good family life																																			00
Prevention to fluctuating prices																																			00
sum	10	210	00	00	211	511	513	510	1312	310	119	312	511	413	210	212	410	95	246	412	11	7121	1413	37	1426	1016	517	1622	1812	1321	215	13	12	24	